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Rail Road News.

Cheap Railway Fares in England.

The London and Northwestern railway company are carrying out some "extensive experiments" in the way of a reduction of fares, with a view of testing the productiveness of the local traffic. Hitherto the price of day tickets, for certain distances, has been one-third less than two fares, a further reduction upon which, to the extent of one-sixth has been made. The Midland Company have also reduced their fares, and have assimilated them to, and have adopted, the scale on, the Great Northern Railway. The great problem of the age with regard to the profit of railway investments, is to determine what rate of fare will secure the largest revenue. It has been demonstrated, that on the English railways four fifths of the gross revenue comes from passengers at one penny or two cents per mile, and that, invariably, the number of passengers has fallen off, and the receipts have decreased whenever the rates have been raised. The commission formed by the British Parliament to inquire upon this and other pertinent subjects, reported a mass of evidence in favor of low fares that no reasonable man could resist, and some of the English companies propose to give the low fare system a trial upon the most radical scale. We are rather fearful they may not persevere for the length of time necessary to give the system a fair trial. The proper mean is the thing to be arrived at.

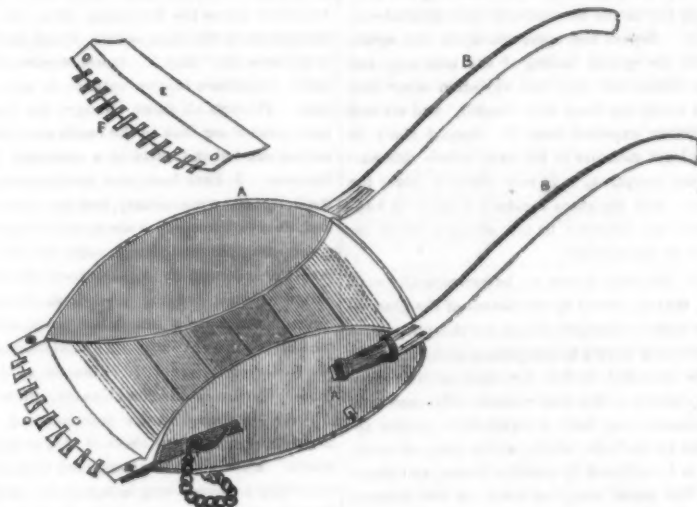
New York and Erie Railroad.

The Buffalo Courier says—"We are informed by Mr. C. Story, who last winter ably represented, in part, the county of Dutchess, in the Assembly, and who is now doing some of the heaviest, if not the heaviest work on the Erie Railroad, that the entire balance of the line, from Corning to Dunkirk, will be finished and in complete running order, on the first day of May, 1851. Mr. Story's contract covers the most formidable work to be done. It is twelve miles in length. He is now working one thousand men, daily, and is about to put on five hundred more. Every section is under contract, and is being prosecuted with the utmost vigor. Another season will therefore witness the effect which this route will have upon the vast tide of travel flowing from the west.

It has been announced that Mr. Sellers, of Cincinnati, has been appointed Mechanical Engineer of the Panama railroad, to reside in this city. The company propose to complete the work to Gorgona by June, 1851, and the whole in two years. The road will be first laid to Chagres on pile, to be filled with the excavations on the line. The rail is to be made of wood found along the line, so hard that it is difficult to work it by common tools.

The passage of the Texas Bill, giving her ten millions, will enable her to pay off nearly her whole debt. We hope her citizens will then invest considerable in plank, or railroads.

SWEET'S PATENT EXCAVATING SCRAPER.



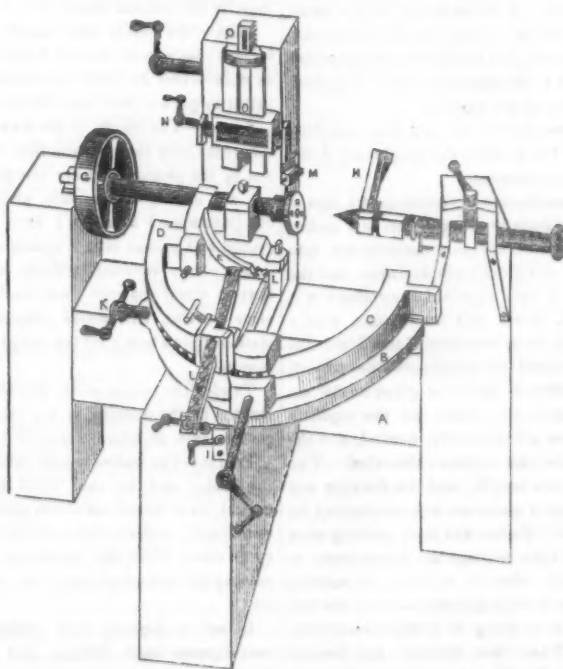
This scraper is the invention of Mr. Joseph Sweet, of Hughesville, Lycoming Co., Pa., who has a patent for the improvement. The distinguishing feature of this invention is the introduction of moveable teeth on a circular surface, the teeth being in condition and number adapted to the condition of the soil in which the excavator is used. The sides of it may be made of wood or metal as represented by A. A. B B are the stilts or arms, C is the moveable mouth piece with the teeth D. The teeth on the mouth piece of the excavator, are broad and flat in front, capable of plowing up in gravelly soil: the teeth, F, in the detached mouth piece E, are narrower at the extremities and are adapted to excavating in stiff and

clayey soils. This excavator can be used in all soils, and it is particularly adapted to obviate entirely the use of a plow in stiff soils. It is useful in making roads, for levelling, digging ditches, canals, cellars, railroads, and other kinds of excavations. It is made strong and durable, and the price of one we believe is \$8. We have seen some strong testimonials respecting its good qualities, given by those who have used it.

This scraper has just been awarded a diploma at the State Fair. Remember that it is an Excavating Scraper, with moveable teeth.

More information may be obtained by letter addressed to Mr. Sweet.

EVERETT'S WOODEN BOWL TURNING MACHINE.



This is an improved machine for turning wooden bowls. It is constructed to alter the shape or thickness, and it will turn seventy feet of bowls per hour. It is easily kept in order, and its simplicity is one of its peculiar traits. The bowls made by it are wonderfully smooth and perfect in form.

A is part of the frame; B is a moveable bottom, and is moved by the screw handle, I. C is a semi-circular frame placed on the top of the moveable bottom; it is moved by the screw

handle, K, at right angles with the direction of the moveable bottom; D is a reciprocating frame turning on a pivot, which is connected with the semi-circular frame, C; it is moved by the large crank handle in front, the shaft of which has a pinion on it, which takes into a cog rack on the underside. The cutter arms, E, are attached to this frame; in the said arms are set the spurs and cutters, L, to cut the bowl from the block of wood, which is screwed to the chuck, F. The apparatus for

cutting the outside of the block is also attached to this frame. H is the stock, in which a plane iron is placed for shaping the bottom of the bowl. G is a driving pulley of the spindle. The flat part of the block, which forms the top of the bowl, is first turned off by the cutter, M, which is moved up and down by a rack and pinion, Q, operated by the crank handle, N; the frame, D, is then adjusted to the block by the screws, K and J, (turned letter), and the outside of the block is shaped by the cutting apparatus, H, the cutter of which is brought against the block by a screw; the cutter arm, E, with its cutter, is then placed in the frame, D, and by turning the large handle in front, the cutters are pushed into the centre, forming the bowl, which is then taken off, and another, a size less, is placed upon the reciprocating frame, and another bowl taken off, and then another, till the block is used up.

The inventor of this machine is Mr. Addison Everett, of Middlefield, Mass., who secured a patent for the same on the 30th of last July. He has spent several years in bringing it to its present state of perfection, and encountered many difficulties, like all original inventors. After his machine was in operation as a fixed fact, though not abandoned to the public, an inferior machine was got up and patented by one of his neighbors, which proved to be some obstacle to Mr. Everett's success, who wisely purchased the whole right, and is now the proprietor of his own patent as well as assignee of the other. The invention is well secured against all infringement. This machine will supersede the tedious process of hand turning, and it saves about one-third of the timber; the bowls are smooth and not liable to split; hard or soft wood can be used. The bowls can be made half an inch thick, or any thickness required, and as the demand for wooden bowls in every part of the world is almost unlimited, the use of Mr. Everett's machines will form a profitable item in the statistics of our country.

Useful Receipts.

Gravity.

A heavy body falls through 15,0954 feet in one second in the latitude of London, in a vacuum at the level of the sea; the double of this quantity, or 30.1908 feet, is the measure of gravity at that place. At Paris, under the like circumstances, the fall of a heavy body is 4.90434 metres, or 16.0906 imp. feet; and the measure of gravity 9.80867 metres, or 32.1812 imp. feet.

The spaces described in different times by a falling body, are to each other as the squares of the times from the beginning of the descent; or, which produces the same result, they are as the squares of the velocities acquired at the end of those times.

Gravity and specific weight are not always interchangeable terms—gravity being a power of which weight is the effect.

To find the Tonnage of Ships.

Rule 1. Multiply the length of the keel, taken within the vessel, by the length of the midship beam, taken also within, from plank to plank, and that product by half the breadth, taken as the depth; then divide the last product by 94, and the quotient will give the tonnage. If the length of a ship's keel be 80 feet, and the midship beam 30: required the tonnage.—Ans. 385.9787 tons.

We have a number of communications awaiting attention. Owing to the extent of our index, the best we have ever got up, some communications are laid over until another period.

Miscellaneous.

History and Construction of the Thermometer.

(Continued from page 403.)

PRECAUTIONS NECESSARY TO BE OBSERVED IN CONSTRUCTING ACCURATE THERMOMETERS.

A general idea has been already given of the mode of constructing a thermometer, but where so much accuracy is required, there are many niceties that demand attention.

1. The tube should be of equal diameter throughout the whole stem. As obtained from the glass house, the tubes are in reality frusta of very elongated hollow cones, which by extension, become more or less nearly cylindrical, and as the divisions of the scale are usually equal, it is very important that the tube should not perceptibly differ from a true cylinder.

For these purposes, after a tube has been chosen by the eye as equal in calibre as possible, the best makers blow a bulb on it, and introduce a short column of mercury into the stem, perhaps an inch in length, which is accurately measured on a fine scale of equal parts in different portions of the tube, as the column is, by the heat of the hand, moved from the bulb to the open extremity of the tube. Should the mercurial column subtend the same number of divisions on the scale in every part of the tube, it may be considered as a perfect tube for the thermometer.

The late Mr. Wilson, of Glasgow, introduced thermometric tubes of an elliptical bore. The advantage of this form is, that a very small column of mercury is much more visible when it is expanded at right angles to the line of vision. If due precaution be taken to ensure the equality of the tube, this form answers well, especially for ordinary purposes; but where great nicety is required, we would commend the cylindrical tube.

2. The form and proportion of the bulb may vary according to the purpose for which it is to be applied. The larger the bulb in proportion to the stem, so much more delicately susceptible of changes of temperature will be the thermometer. The spherical bulb is to be preferred, for their shape is least likely to be affected by the varying pressure of the air; but when the bulb is very large, this form renders the thermometer less susceptible of minute changes of temperature, and pyriform or cylindrical bulbs are usually adopted.

In forming the bulb the mouth must not be employed to blow it, otherwise moisture will condense in the tube, which is expelled with much difficulty, and, if suffered to remain, will greatly impair the value of the thermometer. Good instrument makers use a small bottle of caoutchouc, or elastic gum, fastened by a thread on the end of the tube, while the other extremity is softened by the flame of a tallow lamp, urged by a blow pipe. By compressing the bottle, after the orifice of the softened end of the tube is closed by the aid of another rod of glass, a bulb is formed of any required size; but a neat workman will rarely consider the first blown bulb sufficiently well formed for his purpose. It is generally dilated till it bursts; the glass, while still soft, is compressed into a rounded mass, and a fresh bulb formed of a regular shape and size proportioned to the calibre of the tube. Should the artist not intend to seal the tube immediately, he usually hermetically seals the other end of the tube to prevent the entrance of damp air and dust.

3. The necessary precautions used in filling thermometers with mercury are plainly pointed out in Nicholson's Chemistry, viz:—

The mercury should be clean, dry, and recently boiled, to expel air as much as possible. Mercury is often cleaned by thermometer makers by agitating it in a phial, for some time, with sand, and then straining it through leather: for nice instruments it should be distilled from iron filings, or reduced from its sulphurets in clean iron vessels at a moderate heat.

The bulb to be filled, is heated in the flame of the lamp, and the open extremity of the tube is immersed in the mercury; as the bulb cools the pressure of the atmosphere forces through the fluid into the tube and ball. The

bulb should be but moderately heated at first so as on cooling to become only half filled.

4. To ensure a delicate thermometer the mercury is next to be boiled in the thermometer. For this purpose a slip of clean paper is to be rolled tightly round the upper part of the tube, so as to form, beyond the orifice, a cup or cylinder, capable of containing as much mercury as the bulb: secure this round the tube with a thread, put a drop of mercury into the paper cavity, and again apply the heat to the bulb, holding the tube by the part covered with the paper, the mercury will soon boil, and about one half of the contents of the ball will rush up into the paper cup. On removing the bulb from the candle the mercury will suddenly return. Repeat this operation again and again, until the speedy boiling of the mercury, and the diminished rise and agitation show that the whole has been well heated, and air and moisture expelled from it. Should there be the least moisture in the tube before this part of the operation, it is very likely to burst the bulb; and the same accident is likely to happen if the mercury be too strongly boiled the first or second time.

5. The tube is now to be hermetically sealed, that is, closed by the fusion of the glass at the upper extremity, which, for this purpose, is previously drawn to a capillary orifice. When it is intended to free the tube entirely from air, which is the best method with mercurial thermometers, heat is again to be gently applied to the bulb, which, at the same moment, is to be softened by another flame, and closed in the usual way, as soon as the mercury reaches the extremity of the tube. When the ball has cooled a little, the sealing is rendered more secure by fusing the glass more fully around the top, so as to completely obliterate the orifice. If the vacuum be perfect, the mercury will fall to the extremity of the tube, on inverting the thermometer, unless the calibre be absolutely capillary; in which case capillary attraction will overcome the force of gravity, and the mercury will retain its position in the tube, in every situation of the instrument. Where there is a complete vacuum in the tube, the mercury must be well boiled before the sealing, as above directed. And when we choose a thermometer, the ready falling of the mercury, on inversion of the tube, is the best test we can have that the mercury has been well freed from air and moisture. This vacuum is not, however, so essential to the true action of the thermometer as was once supposed. A thermometer with a small dilation of the tube when sealed, containing some common air, has lately been recommended as preferable to the instrument with a vacuum on the surface of the mercury.

6. We come now to the last and most delicate step of the process, the adaptation of the scale to the instrument.

In the manufacture of thermometers this is conveniently done by plunging the new instrument, along with a standard thermometer, into two liquids at different temperatures: but the graduation of this standard instrument is a work of such nicety and importance, that a committee of seven members of the Royal Society was formed to investigate the subject, and their elaborate report is given in the society's transactions, where all the requisite circumstances are distinctly noticed, and the best manipulations minutely described. Two fixed points are sought, and the freezing and boiling points of water are most convenient for that purpose. To find the first, nothing more is necessary than to place the thermometer to be graduated, after it is filled, in melting snow, or ice, in such quantity around the ball and tube, as to bring it to the desired temperature. When the mercury has become stationary in the tube, a mark is to be made on the tube with a file, just opposite to the top of the mercurial column, and that mark fixes the freezing point of the scale of the instrument. The determination of the boiling point is much more difficult because it is affected by atmospheric pressure, and even by the form of the vessel in which the water is heated. The Committee of the Royal Society recommend that the boiling point ought to be fixed under a barometrical pressure of 29.80 inches.

The Present Cotton Crop.

Any cry of a short crop from the southern planter is considered an attempt at a panic by the cotton brokers of New York and the spinners of Manchester. But the culture of the cotton-plant and the theory of its production, have been reduced to such unerringly successful practice, and to experiments and calculations, by millions of attentive and observant minds, that neither will hardly allow of any improvement. Any intelligent planter can tell you precisely what effect certain kinds of weather will have upon the cotton crop—whether a rain will make the "squares" "sheer," or "stick," whether damp, cloudy weather will benefit or injure the devouring "lice," or whether precisely the same season would increase or decrease the "rust." Sometimes drouth benefits, sometimes injures cotton; so also with rain. Through all these changes an intelligent planter can look to the result as certainly as you can tell the effect of a chemical combination. I have been over every section of the cotton-growing country, and my experience and observation enables me to state that any great atmospherical change near the 32° N. latitude, is certain to be general over the whole cotton region. Judging, then, from our experience, let us make a calculation as to the extent of the present crop. An examination of the following causes will enable us to determine: Human or Artificial Causes; these are,

First—Our planters are just learning that first rule of trade—the effect of supply and demand. Experience has compelled them to believe that a shorter crop brings more money; ergo, by general consent they have not increased their crops.

Second—The changing of cotton into sugar plantations, in the States of Texas, Louisiana, Mississippi, Alabama, Georgia and Florida.

Third—The immense amount of labor (entirely black) diverted from the culture of cotton to the building of railroads and factories.

Fourth—The scarcity of corn, from last year's frost, has raised its price from 100 to 200 per cent. (varying in different localities,) and has compelled planters to increase the corn crop. Indeed, I do not know, even under the increased planting of this year, a single farmer who will have corn to sell.

Fifth—The continued agitation of the slavery question has diverted capital from the cotton culture.

I think you will agree with me that these causes are competent to produce some effect. Now for the natural causes—

First—The seed is very much deteriorated by last year's frost; indeed, if next year proves as unfavorable as 1849–50, we shall be compelled to get our seed from Mexico again.

Second—The length of the season, which is six weeks later than usual; this is easily proved by the picking; I have not picked a boll yet, and shall not commence until about the 5th [last week,] although I have had cotton ginned and packed fully a month earlier. My father, a very successful planter, had a saying that he would not give "one stack two weeks older for two, two weeks younger." Every planter knows how good the adage is in a short season.

Third—The cotton stock, thrown back and stunted by the drought, is too small to bear a good or even an average crop of bolls.

Fourth—The immense heat (average 95° in the shade) and no rain (2.95 inches in ten weeks), have forced the cotton plant to an early maturity, and the bolls are not half as heavy as usual, while the continuous drought is causing the bolls and squares to drop continually.

Indeed, it depends upon continuous moderate showers until October, and a very late frost, whether we make a decent crop; though I do not know whether an early frost will damage the crop or not, as this fall is an anomaly in cotton culture. The last crop of "squares," if this is an ordinary season, (frost 15th of Oct.,) have been made about two or three days since; as we do not calculate upon a "bloom" after Sept. 10, and it requires 3 weeks for a square to form a bloom. Last year we had equal to no frost at all, as I have "ratoon" cotton in my corn fields which came up from the old stocks, and has stood four

plowings without being killed. Without pretending to estimate the crop, I must say, that I think it (the crop of 1850–51) will prove the shortest of a long series of years.

STATE RIGHTS.

La Grange, Geo.

Quadrature of the Circle.

Observing in your paper of the 27th ult., an article on the Quadrature of the Circle, I am led to suggest a few remarks on the subject. —Neither by numbers nor geometry will this question, in all probability, ever be solved—but by a simple experiment in mechanics it can be. Thus, take a block of metal, place the same in a perfect engine and reduce it to an exact square, ascertain how much fluid this square will displace. This can be done correctly by an apparatus that shall leave but a small surface of fluid to be operated on; then take another block of the same material, which should be reduced to the exact thickness of the square heretofore described, place the same in the engine, reducing the other four sides, by turning down until it will displace the same quantity of fluid as the square before described. If correctly done, and the metal have no imperfections in it, the two blocks should weigh precisely alike. This being the case, the square before described is circled, consequently the circle is squared. The proportion of the diameter of the square to that of the circle, or the proportion of the circumference of the circle to that of the four sides of the square, is hereby demonstrated. The square of the sphere, also, is to be obtained by a similar experiment.

EXPOSITOR.

Providence, R. I.

[We have received quite a number of articles on this subject since we noticed the work of Mr. Fleming on the subject. We did not intend to publish any of them, because they reflect no new light on the subject. The above article being short, we thought we would publish it, because others may be wasting their time with the same lucubrations. It is perhaps needless for us to say, that the above leaves the subject in the same region in which it was before, for there is neither formula left to guide, nor proof correctness stereotyped in it.]

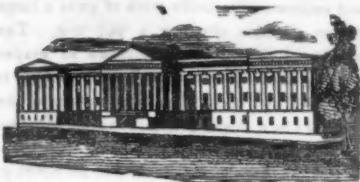
The Floods of 1850.

This summer has been remarkable for its storms and freshets. We do not remember of a summer in which so many storms occurred, and storms of such a destructive nature. From East, West, North and South, the news of disaster by the overflowing of rivers and creeks, is most appalling. During a part of last week, the State of Pennsylvania in the Lehigh region, suffered greatly. Schuylkill river carried dreadful destruction on its swollen waters. In New Jersey there has also been great loss of property, and New York has had her share of disasters. The dam at the Albany Nail Factory, near Troy, was carried away, and much damage done; in fact, from every State we have news of more or less destruction of property by these remarkable rain storms. The year 1850 will be long remembered for its storms and floods. Old men say they do not remember such a stormy season in all their lives.

Rats for the Table.

There are many parts of the world where rats are eaten, and such rats as would astonish those accustomed to our species, which, take even the largest, are Lilliputian as compared with a native of the East Indies, first satisfactorily described by Gen. Hardwicke in the seventh volume of the "Linnæan Transactions." The specimen he described was a female and weighed two pounds eleven ounces and a-half; its total length being two feet two inches and a quarter. He assures us that the male grows larger, and weighs three pounds and upwards; so that the natives have before them on table an animal as large as a wild rabbit, doubtless, as they have no prejudices or scruples, just as palatable.

The theory and practice of Dr. Cheyne was, "the slightest and least of meats and drinks a person can be tolerably easy under, is the shortest and most infallible means to preserve life, health, and serenity."



Reported expressly for the Scientific American, from the Patent Office Records.

LIST OF PATENT CLAIMS
ISSUED FROM THE UNITED STATES PATENT OFFICE.

For the week ending September 3, 1850.

To Lambert Alexandre, of France, for improvements in sub-marine vessels.

I claim the method of effecting a circulation of the air, and of maintaining an atmosphere in the cabin of the requisite bulk to prevent the encroachment of water during the descent of the vessel, and of preventing the waste of air by its expansion and escape from the cabin during the ascent of the vessel, by pumping it either out of or into the cabin or air reservoir, as may be required, even when the density of the atmosphere in the compartment whence the air is drawn is less than that of the atmosphere in the compartment into which it is forced, as herein set forth.

I also claim the device, consisting substantially of the drop platforms, chains, and draw pin, for the purpose of carrying ballast on the exterior of a submarine vessel and of discharging it at will, as herein set forth.

To C. F. Brown, of Warren, R. I., for improved method of attaching lines to harpoons.

I claim the manner of attaching and securing the line to the harpoon by means of the ring sliding on the shank, and the rounded end of the socket or butt, in the manner substantially as herein described.

[This is a most excellent invention.]

To L. S. Chichester, of Troy, N. Y., for improvement in machines for dressing staves.

I claim in the above described machine for shaving staves from rived bolts, the employment of two concave knives for shaving the outer or convex surface of the staves, substantially as herein described, in combination with a single knife for shaving the inner or concave surface of the staves, when the said single knife is placed in a line midway between the other two, that is, opposite the space between the other two, substantially in the manner and for the purpose specified.

To S. A. Clemens, of Granby, Conn., for improvement in pressing cotton, and other substances into bales.

I claim the method of packing and compressing substance into bales or packages in a series of successive layers or strata by means of rolling pressure or its equivalent, substantially as herein specified.

I also claim combining with the laying and compressing rollers or cylinders or their equivalents, a bed which shall be gradually separated from the rollers or cylinders as the layers or strata accumulate, and which shall also traverse from end to end under the rollers or cylinders or vice versa, substantially as specified.

I also claim, in combination with the cylinders for packing and pressing substances in successive layers, a lapping apparatus for forming such substance or substances into a lap or laps, to be delivered to the rollers or cylinders or their equivalents, to be laid and pressed into the bed substantially as described.

I also claim, in combination with the laying and compressing cylinders or their equivalents, the series of rollers or their equivalents, for retaining the layers or strata as they are successively compressed, substantially as specified.

I also claim, the bed made without sides or ends substantially as and for the purpose specified, in combination with the carriage provided with adjusting plates at the ends, for the purpose and in the manner substantially as described.

And finally, I claim in combination with the adjusting plates at the ends of the carriage, the stationary plates at the ends of the frame under which the adjusting plates pass, to

remove the substance that may have accumulated on them, substantially as described.

To Samuel Colt, of Hartford, Conn., for improvements in repeating fire-arms.

I claim making the central bore of the many chambered rotating breech which fits and turns on a central pin or arbor, to extend from the rear part thereof to within some distance from the front end, and thus leave the front end closed, substantially as described, to prevent the access of smoke, when this is combined with the connecting of the barrel with the shield piece and lock plate, substantially as described.

To David Current, of Crittenden, Ky., for improvement in hand-spinners.

I claim the combination of the clamp lever with the cord and drum, for the purpose substantially as described.

To Wm. Field, of Providence, R. I., for machine for bevelling the surfaces of washers, &c.

I claim the method substantially as herein described of drawing out and giving a bevel form to metal clinch rings, washers, &c. by the action thereon of the surfaces of a series of travelling rollers turning on bearings, arranged about a common centre of rotation and combined with a spindle or mandrel, adapted to the reception of the clinch rings or washers, to be formed and provided with the means, substantially as herein described, for turning it to present in succession every part of the periphery to the action of the rollers, substantially as described.

I also claim, in combination with the spindle or mandrel for presenting the clinch rings or washers to the action of the travelling rollers, a gripe, substantially as described, for gripping and holding the said rings or washers on to the spindle or mandrel, whilst passing under the action of the travelling rollers as described.

To C. W. Finzel, of Bristol, England, for improvement in draining sugars.

I claim the mode of applying steam or liquids, to machines used for separating syrups or fluids from sugar by means of centrifugal force, for the purpose of clearing and keeping clear the meshes or apertures in the periphery of the revolving cylinders of such machines, in manner herein described.

To E. B. Forbush, of Buffalo, N. Y., for improvement in clamps for holding paper in writing and drawing.

I claim the clamping slides made to slide freely on the parallel rods operated by the lever and the springs, substantially in the manner and for the purpose as herein set forth.

To O. W. Hogle, of Somerset, N. Y., for improvement in fastenings of Hay Rakes.

I claim, first, the manner of holding the teeth firmly in their required positions against the sliding bar, during the operation of the machine, by means of the aforesaid combination of the ratchet wheel, pawl sliding bar, and stern helical spring fixed-bar and slide attached thereto, with the parallel guiding arms and revolving finger shaft, arranged and operating in the manner and for the purpose above set forth.

Second, I claim the combination of the slide helical spring strap and roller, with the parallel arms and fixed bar, for disengaging the sliding stop bar from the rake teeth, without moving the hand from its usual position on the hand roller, to allow the teeth to revolve to deposit the hay in windrows, as herein fully set forth.

To S. S. Jewett & F. H. Root, of Buffalo, N. Y., for improvement in Stoves.

We claim the jambs of stove or grate fronts or ends, constructed with a recess closed by doors, within which the doors of the fire place are folded up and concealed from view; the fire place doors being constructed and arranged to turn back into the recess, substantially as herein described.

To David S. Neal, of Lynn, Mass., for improvement in Car Couplings.

I claim the bearing roller (or rollers) placed within the body of the coupling, and the bearing roller located in one end of the connecting link, for the purpose of enabling the connecting bolt to be easily detached from the link when the cars are in motion; when this arrangement of the said rollers and connecting bolt is com-

bined with the loop, the catch head and cord, for uncoupling, in such a manner that the loop will be disengaged when force is applied to withdraw the bolt, but will prevent the connecting bolt from being accidentally thrown out of place when the cars are in motion.

To J. F. Ostrander, of New York, N. Y., for improvement in Planing Machines.

First, I claim the use and employment of the cutter made in form or any analogous manner, whereby the peculiar cutting, bevelled scolloped edge is obtained, for planing or dressing plank or other material, substantially as herein set forth.

Second, I also claim the use and employment of the cutter in combination with the compressing spring feed rollers and straight edge, or any one or more of them, in form and manner and for the purposes substantially as herein set forth.

To Barthelemy Thimonnier, Sen., of Amplep, France, (Assignor to Philip May of London, England) for improvements in Sewing Machines.

I claim the hook, the surface, the tube or holder and thread carrier, working substantially as above described.

To John H. Towne, of Philadelphia, Pa., (Assignor to Solomon V. Merriek, of Philadelphia, Pa.) for improvements in the direct action steam-hammer.

I claim attaching the hammer to the sliding steam cylinder, substantially as herein described, the steam being admitted and discharged to and from the sliding steam cylinder, substantially as herein described.

To Wm. P. Tatham, of Philadelphia, Pa., for improvements in manufacture of lead pipe.

I claim the method, substantially as herein described, of setting or cooling the inside of the mass of metal within and throughout the length of the cylinder and before or preparatory to pressing out the pipe, by passing a cooling fluid into or through a long core or core-holder, extending through the length of the cylinder, as herein described, the said method having the effect at the same time to keep the said core or core-holder cool and stiff, as described.

To Seymour Tomlinson, of Washington Hollow, N. Y., for improvement in apparatus for Breaking Horses.

I claim the method, substantially as herein described, of breaking horses by means of the shafts which are connected together by a bow passing around in front of the horses breast, substantially as herein described, in combination with the two straps, one passing over the crest and the other under the breast, by which the horse is harnessed to the said shafts, substantially as described.

To Benjamin Welch, of Lakeville, Conn., for improvement in Surgeons' Splints.

I claim my improved surgeons splints, composed of thin strata of wood combined with some elastic adhesive substance interposed between them, substantially as herein set forth.

Magnetic Principles of the Solar System, or, Deductions from Experiments with the Solar Magnetic Engine and previously known Astronomical Truths.

BY WM. W. HUBBELL, ESQ.

On surrounding a solar magnet of six inches diameter, by eighteen equidistant planetary magnets, I found that by charging the solar magnet with magnetism, and leaving the planetary magnets or bodies uncharged by the batteries, the solar magnet would polarize them at the clear distance of one inch, (a greater distance I did not try.) This fact convinced me that magnetism diverged from the entire circumference of a solar magnet, similar to the radiation of light from the sun, or any body of light. It is also a known fact that the rays of the sun will, in a few minutes, cause a magnet to be more powerful than it will be when kept for a considerable length of time in the dark, showing that the sun-light is instrumental in the production of magnetism. These facts, together with almost universally known astronomical truths that will be recognized in what I am about to state, lead me to the following superstructure of material law, accounting for the variations and intensity of the magnetic needle; of all which I have no doubt.

In analogy to the solar magnet polarizing its planetary bodies when not polarized by a battery, I suppose the sun or solar centre to

polarize its planets by means of its divergent rays of light; that these rays of light, like the fluid of the solar magnet, diverge strongest at right angles from its axis; that the polar axis of the planets, or focus line of their poles, is always (about) parallel with the axis of the sun; that the attraction and repulsion existing between the sun and his planets, causing them to approach and recede, and revolve around him, are brought about by the alternate approximation of their poles, owing to the respective oscillating movements of the planets; by means of which, with the earth, (as we say,) the sun passes back and forth between the tropics;—this approximation in the solar engine is produced by changing the planetary poles at the points of aphelion and perihelion by means of the galvanic battery, being another mode of producing alternate approximation of the planetary poles.

My theory, or superstructure of material law, is this: That the sun, by means of his rays of light, polarizes the planets; and the earth being one of those planets, has, as it rotates on its axis, generated by the light of the sun acting on it, a belt or current of electricity strongest between the tropics, over the torrid zone, which polarizes the extreme parts of the earth, to wit, the north and south poles. Now, as the earth oscillates, and the axis or focus line of the poles must be parallel with the axis of the sun, it is evident that the focus of the poles and the axis of the earth can only be coincident when the sun is, as we say, on the equatorial line of the earth, and that at all other times, the focus of the poles must be moving in an approaching or receding spiral circuit about the axis of the earth; this precise conformity of parallelism of polar focus of the earth with the axis of the sun, would also be governed or influenced by the residuary or permanent magnetism of the earth, from which the attraction and repulsion must ensue in the alternate approximations of the poles to the sun; this would influence the degree of variation of the focus of the poles, but nevertheless, true it is, and in accordance with other astronomical truths, that the sun, by means of his light, polarized his planets, and that the focus of the poles can only be coincident with their respective axes when he is opposite, or is passing the equatorial line; and that at all other times the focus of the poles is in a spiral circuit, either approaching, or receding from, the axis of rotation of the planets respectively; and as respects the earth, the magnetic needle at sea and elsewhere varies, always pointing to the focus of the poles, governed by that focus, and varying about the axis of the earth's rotation as it varies. Again, as the sun by his light polarizes the planets, and the earth varies in distance from the sun as it traverses its annular orbit, it follows necessarily that the intensity of the poles must change with the change of distance, and that the polarization is strongest when the earth is at its aphelion, and least when at its perihelion. This affects the intensity of the magnetic needle, and also another fact affecting it, is the varying distance of the polar focus, as it moves in its spiral circuit about the axis of the earth.

There is no law or demonstration that I can find to controvert this superstructure of natural law; the known variations, of course, and intensity of the magnetic needle, or compass itself, go to confirm it.

By a series of observations and calculations based upon this superstructure of natural law, made at our National Observatory, it is highly probable that the focus of the poles of the earth can be located at any given time on any future day, and thus greatly increase the security of navigating the ocean by the aid of the compass.

Philadelphia, Aug. 10th, 1850.

No less than \$26,000,000 are paid in duty every year, in Britain and Ireland, for home-made whiskey; the wholesale cost is \$40,000,000. For beer, rum, wine and whiskey, more money is spent every year than the whole income of the government—that which keeps up the immense fleet and army of the land.

At the present moment Electro Magnetism, is engaging a great amount of attention.

New Inventions.

Improvements in Carding.

Messrs. J. Lambert & J. Zimmerman, of Waterloo, N. Y., have made an improvement in the working of Carding machines, for which they have taken measures to secure a patent, and which is said to card double the quantity at least, in the same time, than has usually been done by the old mode of operation. The "Workers," instead of carrying round the wool from the main cylinder, at once, by revolving in a contrary direction, revolve with it, and carry the wool but a short distance to the strippers, and thus, by the way, they are geared; the "workers" are rendered workers indeed, and not merely in name.

Tapestry, Velvet, and other Carpets.

Mr. James Templeton, of Glasgow, Scotland, has taken out a patent in England for an improved method of manufacturing carpets, the designs of which are produced from the *weft* threads, which are previously printed to produce the design or pattern. He makes velvet carpets by employing *chenille* weft, previously printed, which weaves up into the patterns designed; he also makes carpets by the printed weft, which work up into patterns on both sides of the carpet, like those of the ingrain carpet. The principle of this important improvement in carpet weaving to do away with the *jacquard*, lies in the mode of printing and preparing the weft, previous to weaving.

Scientific and Mechanical Information.

More than ever, our attention for the future will be devoted in procuring the latest and most important information from all parts of the world, respecting new and useful improvements and discoveries. Our correspondent in London, of whom we spoke a few weeks since, will impart interest to our columns, by his reviews on the Grand Industrial Exhibition, to be held in London next year. All inventors prefer to have engravings and descriptions of their inventions brought first before the public, through the *Scientific American*. The reason is plain; we have the largest circulation of any other paper, and the public look to our columns for what is *new and useful*.

Improvement on Steam Engines.

Messrs. B. Donkin and W. Farey, styling themselves Civil Engineers, have recently taken out a patent in England for improvements in disc engines, connected with which, their patent embraces an improvement in working slide valves to equalize the pressure of the steam on both sides of the slide; to do this, the face on which the valves slide, is serrated or grooved, and these grooves will contain steam under the valve.

To Inventors and Patentees.

Our list of patent claims is worth more to you than the price of the volume. Our index is so arranged that all the patents granted, are classified, and affords a most useful and standard work of reference. Inventors who consult their own interests, cannot be without the *Scientific American*.

Crank and Pulley.

A number of experiments with two boats, the one named "Crank," and the other named "Pully," have lately been made on the East River, by Mr. Peter Yates, to test the comparative value of Mr. Yates' invention; the Pully, we have been informed, has universally been the victor. In the course of one or two weeks we will illustrate Mr. Yates' invention of the "Pully," as applied to a steam engine, in place of the crank.

Notice.

In referring to the address of the proprietors of the Rotary Brick Machine in our last week's number, it should have read, "Address Wagner & Imlay, 203 Market, or 74 Walnut st., care of A. Miller, Esq., Philadelphia."

India Rubber Plute.

An eight keyed flute made of india rubber has been made in this city, by Mr. Badger. It has a fine polish and looks like tortoise shell. It has a beautiful tone and cannot be affected by the weather.

Improved Machinery for Grinding Spiral Knives.

Mr. Jas. L. Plimpton, of Westfield, Mass., has invented some valuable improvements on machinery for grinding Spiral Knives, for which he wisely has taken measures to secure a patent. The invention embraces two new and excellent features; one is to grind the edge of every one of the same bevel, and to change the bevel on the frame which holds the knives

without changing the knife or knives, as in the old way; the other is to accommodate the feed of the knives on the frame to the speed of the stone, to make the grinding time uniform—this is done by a friction roller on a swinging frame, running in contact with the stone, so that as the stone decreases in diameter the feed of the knife frame becomes slower in proportion.

BROWN'S ECCENTRIC TOBACCO PRESS.

Figure 1.

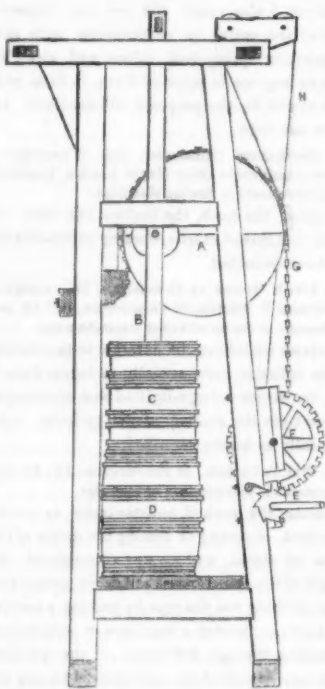
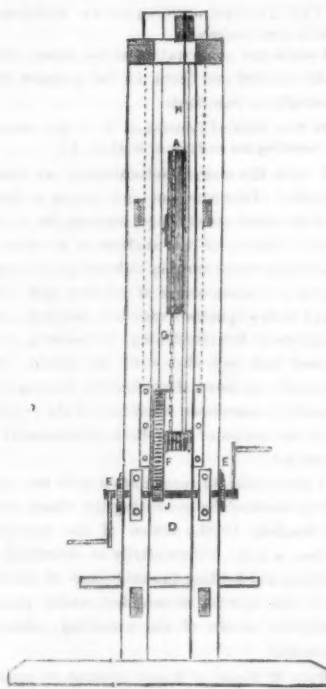


Figure 2.



This engraving represents a side and an end view of a press constructed upon the principle embraced in the patent of Mr. A. D. Brown, of Clinton, in Georgia. It is intended for pressing tobacco on plantations, but it is equally applicable to the pressing of hay, as a cider press, &c. As the principle patented is described on page 96, this vol. *Sci. Am.*, we need not describe it again. In this press the crank, axle and wheel, and the eccentric pulley are combined, and according to modifications of gearing, the power may be increased to any amount; the principle of great speed where little power is required, always being maintained, and vice versa. A is the eccentric lever pulley; B is the stock of the pressure block; C and D represent the barrel and packing cover; E E are the ratchets; F, the cog wheel on the drum shaft, which is driven by a pinion, J, (fig. 2); G is the chain passing round the drum, F, over the eccentric pulley, and is secured on a strong block on the frame; H is the rope which raises the follower and block up, after the tobacco, &c., is pressed in the barrel or box. It is not necessary, after our reference

above, to describe the operation, any further than to say, that if the pin is 1-16th of the diameter of the eccentric pulley from its periphery, and a 48 inch cog wheel, 6 inch pinion, 8 inch drum for the chain, and 15 inch cranks are used, the power applied will be multiplied nearly 300 times; any amount of power can be applied by this kind of gearing.

It is, perhaps, a work of supererogation in us to say any thing more in favor of this simple press—to show the beauty and elasticity of application to so many useful purposes, and to set forth its very extraordinary merits. In Georgia, where Mr. Brown has been known for twenty years as a good practical mechanic, his press has at once arisen to eminence, and come into extensive use, and, at the present moment, he has orders from almost every State in the Union for presses, for cotton, hay, tobacco, or some other purpose. All the parts being so simple, so easily made, and so easily kept in repair, no wonder it at once met with a favorable reception when it was first published in our columns.

Variations of the Compass.

The loss to Great Britain by shipwrecks, appears from carefully prepared statistics, to amount annually to between 500 and 600 ships, or about three vessels in every two days. The cause has been attributed, in a great measure, to misdirections of the compass produced by attractive power of the iron used in the construction of the vessels, as well as the funnels, tanks, and guns employed in men-of-war. The result varies in different cases, and a remedy can only be obtained by direct experiment on board each ship. A "compass observatory" has accordingly been established in England, where every ship of the Royal navy has its compass adjusted before proceeding upon a cruise. The practice has, as yet, not been extended to the mercantile marine.

The Bakatlas of South Africa.

The Bakatlas work a great deal of iron, manufacturing various articles, with which they supply the neighboring tribes. They obtain their iron from ore, which they procure by excavating in the surrounding mountains. This ore is smelted in crucibles, a great deal of the metal being wasted, and only the best and purest being preserved. They use a sort

of double bellows, consisting of two bags of skin, by which the air is forced through the long tapering tubes of the two horns of the oryx. The person using the bellows squats between the two bags, which he raises and depresses alternately, working one with each hand. Their hammer and anvil consist of two stones. They nevertheless contrive to turn very neat workmanship out of their hands, such as spears, battle-axes, assagais, knives, sewing-needles, &c. The men of this tribe also manufacture large wooden bowls, which they cut out of the solid piece, the tool they use for this purpose being a small implement shaped like an adze.

The Largest Grape-vine in the United States.

Under this head the Natchez Free Trader, of the 10th inst., has the following paragraph: Mr. William Casey, corner of Union and State streets, in the city of Natchez, can boast of a grape vine which is, undoubtedly, the monarch vine of the United States. It rises from the ground in a single trunk of some three inches in diameter, nearly straight, and well proportioned, to the height of about nine feet, when it spreads into branches, and covers

and embowers the trellis work of quite a large garden, besides climbing a tall tree. The weight of the immense clusters of grapes hanging upon it, now about half grown, is estimated at a ton. To stretch out any of the branches in a direct line, they would measure from three to four hundred feet. The description of the grape is not natural to the country, but was brought to Natchez in the old Spanish times. It is called the "Jack Grape," from "Spanish Jack," the nickname of the Spaniard who planted it. Some years ago, Madame Bingaman, now dead, offered Mr. Casey five hundred dollars if he would remove the vine safely to her garden, in the environs of the city; but no sum of money whatever, would induce the owner to part with it. It produces a wine which has the taste of Hock.

The Electric Telegraph in Europe.

It is well known that various projects have been proposed for a Transatlantic Telegraph; this will be no easy matter, owing to the length of wires required. In the present state of Electric Telegraph science, it is impossible, owing to the distance of such a length of wire between the batteries. Between Calais in France, and Dover in England, the distance being no more than 25 miles, the project of an ocean telegraph is not only feasible, but the construction of one is in actual operation to unite France and England. The Telegraph is to be on Bain's principle, now so well known in America. The telegraph, like steam navigation, will be the means of spreading rapidly the arts and sciences of civilized nations among all lands. The *Dublin University Magazine* says:

"When the powers of this improved telegraph shall be brought into full operation, and when the mode of intercommunication shall be available by the public in all parts of Europe, great changes in the social and commercial relations of the centres of commerce and population must be witnessed. Hitherto, the use of the telegraph has been limited to the Government. The public has been altogether excluded from it. Such a system, however, cannot be of long duration, and the precursors of a speedy change are already apparent. A project of law has been presented to the Legislative Assembly, by the French Government, to open the telegraph to commerce and the public. Lines of electric telegraph have been constructed, and are already in operation, along the principal lines of railway in France. A commission has been appointed, by the Belgian Government, to report upon the means which ought to be adopted to construct lines of electric telegraph throughout that kingdom. Lines of considerable extent are in operation in the Prussian States, and still more extended systems are in preparation. Measures are in progress for the establishment of lines of electric telegraphs in the territories of Austria, Saxony, Bavaria, Wirtemberg, Baden, and all the lesser states of Germany. The Emperor of Russia has issued orders for the construction of lines of telegraphic wires to connect St. Petersburg with Moscow, and with the Prussian, Saxon, and Austrian lines of telegraph."

Sticking, or Court Plaster.

Bruse a sufficient quantity of isinglass, and let it soak in a little warm water for four-and-twenty hours; expose it to heat over the fire till a greater part of the water is dissipated, and supply its place by proof spirits of wine, which will combine with the isinglass. Strain the whole through a piece of open linen, taking care that the consistence of the mixture shall be such that, when cool, it may form a trembling jelly.

Extend the piece of black silk, of which you propose making your plaster, on a wooden frame, and fix it in that position by means of tacks or pack-thread. Then apply the isinglass (after it has been rendered liquid by a gentle heat) to the silk with a brush of fine hair (badger is the best). As soon as this first coating is dried, which will not be long, apply a second; and afterwards, if you wish the article to be very superior, a third. When the whole is dry, cover it with two or three coatings of the balsam of Peru.

Scientific American

NEW YORK, SEPTEMBER 14, 1850.

To our Subscribers.—The End of the Volume.

This number concludes the Fifth Volume of the Scientific American. From a small beginning, it has grown to have the largest circulation of any other paper devoted to the same objects, in this or any other country. For our extensive circulation we are more indebted to the interest which our subscribers, universally, have taken in its prosperity, by the zeal they have exhibited to promote its circulation and widen the circle of its influence, than any other paper ever published in our land. To you we can say with gratitude, "Your breath hath filled our sails." We have the same trust and confidence in the good will and kindness of our subscribers that we ever had, and which has never disappointed, but more than realized our expectations.

In casting a glance over our labors for the past year, we cannot wrap ourselves up in the habiliments of self-pride and say, "we have done all things to perfection." Mortals are not faultless; all have their faults—the best have their failings. We have always endeavored to conduct the Scientific American impartially, honestly and independently. Without fear, or regard for favor, we endeavor to speak and do what we think is just and right, and leave the consequences to the Great Ruler.

As a paper devoted to science and the mechanic arts, it has not its equal in this country in any respect. We do not say this as a mere matter of boasting,—this is universally admitted on all hands. We present to our readers more new inventions, illustrated, more real every-day practical information, and a greater variety of well packed condensed matter every week, than any other paper. A yard of cloth is not valued as a yard, but according to its quality, neither should any person value a scientific and mechanical paper by its size, but by what it contains. Our advantages in obtaining useful information, and a knowledge of what is new in the arts, are far superior to those of any other paper in the United States. Our correspondence is very extensive, and so is our acquaintance with practical and able inventors and mechanics. This acquaintance has been of many years standing, and, with many, our friendship is of the most intimate nature. This enables us to obtain more new and useful information relating to inventions and discoveries, than any other paper in our country. To inventors, our weekly list of patent claims are worth the whole price of their subscriptions, and no other paper in our country presents anything at all like the information we have presented, and can present, relating to patents and new inventions. We have added improvements to every new volume, and we will make Volume 6 superior to all its predecessors. We are determined to labor more assiduously and fervently than ever, to maintain the character of the Scientific American, as being "The Best Mechanical Paper in the World." We hope our subscribers will try and get others to club along with them for Volume 6. We intend to lay out considerable more expense on it than on our former volumes. It will be the best Encyclopedia—as a weekly paper—of mechanical and scientific knowledge, ever published. We hope subscribers will send in their subscriptions early. We can assure every man, that he will get the full value of his money, and will never repent having become a subscriber to the Scientific American.

Engravings.

It has always been allowed that the engravings in the Scientific American, far excel those of any other mechanical paper; we will still keep at the top of the sheet. Our next volume will present the greatest number of unrivalled illustrations ever presented in a weekly paper. Our readers may depend upon it, that their subscriptions will be seed sown upon good ground, which will spring up and bear them good fruit.

The Great State Fair.

We took the opportunity, last Friday, of visiting the State Agricultural Fair, held at Albany. We were assured that the day was the most pleasant of all the preceding ones of the week, as a rain storm had laid the dust of that dusty, dusty road, between Albany and Troy. The Fair tents covered an extensive area, but not more so than those for refreshments, gambling, and all manner of Riff-Raffs. In one place there were Irish jigs going on, as a faithful specimen of the *finest peasantry*, full of humor as at Donnybrook. Circuses, raree shows closed up the back ground, with "warm meals at all hours," by a representative of the press, who, no doubt, had the wisdom to discern that food for the stomach was as necessary as food for the mind and a feast for the eyes. Along with much evil there was much good.

With the live stock it is not our province to deal, although we have some skill there, Hal, and have been held a connoisseur in beef and mutton. We can, however, say a good word for what we saw of that, more than we can say for the drinking and dancing. "Mechanics' Hall" was the best situated tent on the ground, and the most interesting. It is morally impossible to give an abstract notice of all we saw. We saw many good, new, and useful things, and many, no doubt escaped our notice; and we also saw much that was literally worthless. Mr. Emery, of Albany, exhibited the best and greatest number of agricultural implements that we ever saw collected in one place. He was awarded quite a number of prizes; and so were some of our old friends, whose machines had appeared in the Scientific American. Among these we may mention Lerow & Blodgett's Sewing Machine, on page 1, Vol. 5, Sci. Am.; Mr. Wright's machine from Rochester, for sawing ship and other curved timber, which is illustrated in No. 3 (same volume),—this good machine, as it should, commanded a great deal of attention; Bertholf's excellent Straw Cutter, on page 52, was there; and here let us mention another straw cutter—an entirely new one—which we saw, viz., that of Cleveland & Baker Adams, of Jefferson Co., N.Y.; this straw cutter cuts the whole length of the straw up into pieces at one revolution of the roller. It is very simple, no feeding rollers are used, the feeding blades, of which there are a great number, revolve on a long roller, and cut the straw against stationary knives. Mr. Adams, from Hadley, Mass., was there with his improved Felloe Machine, and his superior Dog for planing machines, all of which have been illustrated in our columns. The Apple Paring Machine of Mr. Weed, illustrated on page 84, was also much admired; Mr. Brown's Candle Mould, illustrated on page 164, was the subject of special notice; Dick's Anti-friction Press and Punching Machine, illustrated on page 220, was exhibited by Mr. Holmes, of New York, and had no equal there; Groshon's Patent Corn Planter, illustrated on page 327, was highly admired; Mr. A. H. Brown's hose coupling, on page 332, was in use on the ground; Mr. Brown is a very ingenious and intelligent gentleman. The improved Plow of Mr. Baker, of Troy, on page 348, had not its superior there, although a plow, belonging to Messrs. Starbuck, surpassed all others, in our eyes, for superior workmanship. Mr. Ide's improved Grain Drill, page 372, and the improved Grain Separator of Messrs. Her-ring, on page 408, were held to be unbeatable in their line. Churns and horse-powers were abundant,—some of the latter were good, and some were worthy of a more benighted age. As usual in all Fairs, there were plenty of Washing Machines, the newest and best of which was that of Mr. Joseph Hall, now of Lansingburg, N. Y., it is named the "Concavo and Convexo Roller Washing Machine;" it is simple, only consisting of two rollers and an endless apron; the apron saves the buttons, &c., and allows delicate articles to be safely washed. The rollers are graduated with coiled springs to accommodate themselves to the washing of all kinds of clothes.

Mr. Winnie, of Albany, had a steam engine in operation, with his "Patent Cut Off," which appeared on page 268, Vol. 4, Sci. Am.; a

section model, showing the whole interior operation, was at work; this improvement should be more extensively introduced—it has but to be seen to be admired. Our friends Hoard & Bradford, of Watertown, N. Y., had one of their unique and compact engines and boilers in full swing; it attracted no small degree of attention. R. V. DeWitt, C. E., of Albany, had a model of his Helix Boiler there; it may be termed the "Turbine Boiler;" it is undoubtedly an economizer of fuel. John Rodgers, of Albany, a first rate engineer and machinist, exhibited the best tobacco cutting machine we ever saw; it is a rotary cutter, with two curved arms, on which the knives are placed; it would make a first rate power straw cutter. Mr. John Gibson, of Albany, had his "Woodworth's Planing Machine" in full operation; the character of this machine being so well known, we need say no more about it than to state, that the principle embraced in the same patent, was employed in a separate machine, turning out excellent mouldings.

Albany and Troy being celebrated for the manufacture of stoves, the number exhibited struck strangers with astonishment; it is no easy matter to say anything new about stoves—we believe the majority of them are specimens of unsound devising; we saw one, however, in full cooking sway, viz., that of Mr. Shaw, of Albany, which gave us a very favorable opinion of its merits: it applies the heat thrown down below the grate to the whole purposes of cooking and baking also. Mr. R. Hilson, of Albany, patented a Hot Air Furnace, exhibited a model grate for coal-burning locomotives, and equally applicable to stoves; the centre of it is a hollow elevated half sphere, to prevent the caking of the coals; this grate is an excellent one for stoves.

Messrs. Hotchkiss & Sage, of Windsor, Broome Co., N. Y., exhibited their Noddle Iron for saw mills, and an improved step for plumbing the spindles of stones and wheels; it is arranged to move the spindle plumb in a bush according to the load on it; it is a new and good invention. Mr. Rowe, of Albany, exhibited a most excellent and ingenious machine for splitting and rolling leather; we have never seen a machine to be compared to this in any manner, for the accomplishment of the same objects.

There were some excellent carriages on the ground. A splendid Brougham, from the coach factory of Gould & Co., of Albany, took our eye; Eaton & Gilbert, of Troy, exhibited a fine Omnibus. Mr. Wemple, of Albany, exhibited a carriage of great beauty. There were two carriage improvements from Old Schoharie Co., which did credit to the inventors. One was the Patent Coupling of D.W. Seeley, of Carlisle, for vehicles, which has not and never had its equal in our own nor any other country. Our cotemporary, Mr. S. Hosack Mix, editor of the "Schoharie Patriot," exhibited a Wagon for Plank Roads, with his improved "oscillatory rolling axle," which is the grand desideratum for changing the axle to accommodate itself to the line of draught in every case where an obstacle is presented or a hill to be surmounted, and at the same time it answers as a *break* in descending steep grades. This is a good invention.

In Manufacturers' Hall the show was good, but the place was mud to the knees; it was impossible to do justice to ourselves or others without a pair of "California boots." Among the many things presented, we were especially struck with some splendid specimens of coloring on cotton, silk and wool, by P. B. Leddy, of Albany. Knowing the great amount of practical chemical knowledge required to be good at this art—an art to which we are all indebted for personal decoration, and respecting which so many are ignorant—we cannot but say that the specimens exhibited did great credit to Mr. Leddy, and were highly honorable to the establishment from which they came, viz., Mr. Giffen's. Mr. Roy, of West Troy, exhibited some shawls made at his factory, which, in every respect, rivalled those made in Scotland. We also saw some leather which was tanned by Hibbard's new patent process in fifteen minutes; some may say, "this process is too quick to be good;" well we say "it is not, if the leather is a test?"

The samples were well tanned; the calf leather was equal to the French. The discovery is a chemical one. Being determined to speak of nothing but what we saw with our own eyes, we must say, that for want of Jack the Giant Killer's boots, and owing to the great crowd, we had too soon to bid adieu to Manufacturers' Hall, taking a last glance at the unrivalled display of Jewelry, by our old friend James Meeks. Ah! here let us add that we noticed some of the linen thread made at Lansingburgh, by Mr. Fisher; this being the first linen thread made in America, it did some credit to Mr. Fisher, but very great improvements have yet to be made before it can rival that made in the north of Ireland and Scotland.

In Floral Hall the exhibition of Fruit and Flowers, was refreshing to the eye, and in the centre were the musical instruments, which were delightful to the ear. A piano with the Dolce Campana Attachment, which appeared in No. 9, Sci. Am., from the manufactory of Boardman & Gray, was a splendid instrument, and so was a six octave, by Ballantine & Barhyt; this instrument exhibited great skill and execution in workmanship.

Owing to the deplorable state of the ground, and the great crowd pushing and driving, many good things, which we would like to have seen, were no doubt overlooked. Two objects of our visit to the Fair were, to see what was new in machinery, and to find out what was intended for the "World's Fair." Respecting the latter we were disappointed, and respecting the whole influence of the Fair, there was much that pleased us, and we saw much to condemn. We will briefly give our views on these points next week.

London Industrial Exhibition

At the Meeting for the Advancement of Science in New Haven, Mr. W. R. Johnson spoke on the scientific interest of the proposed Industrial Exhibition at London, in 1851. He said "it was no doubt known to them all that the British government have formed a committee for the purpose of carrying out the object of encouraging industry in all countries, at the head of which is the Royal Consort, Prince Albert. The British Minister brought the subject, before the government at Washington, and communications with the Governors of all the States were had relative to it. Local committees are formed in the different States to promote the contributions of this country to the Industrial Exhibition, and the attention of this association is earnestly called to it. One of the subdivisions is for raw material and produce. The vegetable and animal kingdom is worthy of being exhibited. Machinery is another class; and it seemed to him of the highest importance that the attention of this country should be called to the fact that 80,000 feet of space had been allotted to America for the exhibition. It is important that nothing should be sent abroad but what would do credit to the United States, and confer a benefit on the individuals forwarding their produce or manufacture."

The arrangements for the reception of foreign contributions, we believe, are very liberal. Every facility is afforded for their convenience and safe keeping. More space in the bazar has been allotted to the United States than to any other nation excepting France; but though we have 80,000 square feet allotted to us, we shall probably have to ask for more room. The American agent, Mr. Thompson, writes that the State of New York alone would, if allowed, fill the entire space assigned to the country. The prizes to successful competitors will amount to at least \$100,000, and will be awarded without distinction of country, by as perfectly impartial a jury as can be obtained.

To Our Cotemporaries.

We sincerely thank our 400 cotemporaries who have published the Prospectus of Vol. 6, Sci. Am. We have always received the most courteous and best wishes of our brethren of the Press; to you we are greatly indebted for our extensive circulation. As you have helped to lengthen our shadow, may yours never grow less. If we can do anything in this city for a cotemporary editor, or publisher, we shall always feel happy to do it.

TO CORRESPONDENTS.

"S. S. G., of Phila."—You will see that we used your favor. Be pleased to accept our thanks.

"J. W. K., of N. H."—Your favor containing \$4 came safe. We cannot furnish you with number 38, vol. 4—nor send the paper from the Boston office, all the papers are mailed from this office.

"I. H., of Md."—We know of nothing having been arranged like your improvement on sawing, and have no hesitation in stating that it is patentable in one of the arrangements, in the moving of the log, but you will see the other arrangement illustrated in page 316, vol. 3, Scientific American.

"H. S., & R. L., of Md."—We will publish about the patent leather next week.

"M. K., of Mass."—If you are satisfied of the practicability and utility of your plan, we should advise you to patent it. It had better be thoroughly tested.

"A. M. T., of Va."—The earliest account of electricity, artificially excited, of which we have any record, is carried back as far as 600 years before the birth of Christ, when Thales, the Milesian, observed that amber, after having been rubbed, possessed the power of attracting light bodies, such as feathers, &c. The person who first contributed essentially to its promotion was Dr. Win. Gilbert, who published a book of electrical experiments in 1600. We are indebted to Dr. Franklin more than any one else for developing this subject.

"G. W., of Pa."—Mr. W. resided in Cambridgeport, Mass., at the time the communication was made. We have not heard from him since—and do not know that he has ever constructed one of his instruments.

"W. F., of N. Scotia."—Such binding as you want will cost \$1.50 per volume.

"A. L., of N. Y."—The first 32 numbers of volume 4 cannot be supplied complete.

"G. S., of N. Y."—The model of your churn has been examined. We do not discover any new feature in it. Churns worked by a crank, and having a perforated dasher have long been in use. Several references could be given.

"J. W. S., of Ill."—Excuse the delay, our business is so extensive. We would say, that no such invention for plumbing wheels is in use to our knowledge, and we believe it to be patentable, but first of all try it, before going to any other expense. The old plan of wedging up the wheels and plumbing them by the spirit level alone, has always been held to be the best.

"J. C., of N. Y."—The meaning of melting the composition, and working it in cold water, is to grind in cold water after it is melted and then lay it on. After it is laid on it should be dried in a very hot stove room. If a small quantity of alum is used along with it there is little danger of it crumbling. It is waterproof, but the exact expense we cannot tell.

"M. K., of N. Y."—It would seem from your description that the principle is the same as the syphon; if so it could not be patented. We can tell much better by having an opportunity of examining a drawing or a model. \$2 received.

"D. P. C., of N. C."—The price of the book you ordered is \$2.50. It cannot be sent by mail unless you authorize us to take the covers off. Can it not be forwarded by express so as to save the covers. Please answer by return of mail.

"S. N. B., of Ohio."—Thomas Blanchard resides in Boston, Mass., by writing to him you can without doubt obtain all the information you require in regard to his wood bending machine.

"G. L. C. D., of Miss."—The invention you refer to is an English invention, and has not been introduced into this country. If any one has a good machine for covering wire and will let us know by letter post-paid we will inform you.

"J. H. C. of Pa."—If you can wait, we intend to treat the subject fully in our next volume.

Answers to Correspondents.

Owing to the great length of our invaluable index, answers to many correspondents is necessarily delayed till next week. Our attention to correspondents will receive a still greater share of our labors than heretofore—great though that has been.

Scientific American for Binding.

As this number closes volume 5, we would suggest to those that desire to have their numbers bound to send them to this office and have them executed in our usual manner, for the low price of 75 cents.

You can depend upon having your volumes well bound by sending them to this office, as they will be executed to conform in style with hundreds that we have bound for ourselves and the trade.

Important Notice to us!

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

To Correspondents.

Friends, we return to many of you our sincere thanks for the valuable information we have received from time to time. You have not only done us but "the State some service." Knowledge is truth, and your labor to diffuse knowledge has been to advance truth, and every man who does this, is a benefactor to his fellow-man.

To all correspondents who have asked for information, we have endeavored to give it to them in all candor. Many have written unto us, whom we could not answer, the reason in every case being good. Some could not get an answer because of the too great length of their letters, and some, we must say, we could not read, not owing to bad composition apparently, but to carelessness in the writers. Many of our correspondents may have been overlooked unintentionally. We endeavor to be careful in this respect, but when we have so many as 50 letters on an average per day, and some of them very long, it is impossible to prevent oversights. It is our intention, however, to employ a greater force and to labor more attentively for the benefit of our correspondents, than heretofore. We hope you will endeavor to extend the circulation of volume 6, and we will endeavor to return you equal favors.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and the year the patent was granted (adding the month of the year when convenient), and enclosing one dollar as fees for copying.

INDEX.

A
Abdominal supporters 66
Abdominal supporters, Henry's 340
Abyssinia, discoveries in 123
Accidents, RR. 323
Accidents, steamboat 323
Acoustics 312
Acoustic apparatus 220
Acid, sulphuric 304
Acid in cholera, prussic 225
Action and re-action, 2 engs. 132, 140
Aerial navigation 27, 69
Aeronautic enterprise 318
Aerostation 389
Aerostation, new discovery in 315
Africa, discoveries in 3
Ague, cure for 185
Agricultural discovery 195
Air, atmospheric 320
Air, density and elasticity of the 39
Ale or porter that has turned sour, to restore 249
Algebraic method, new 36
Alloys, metal 100
Almonds, milk of 385
American Institute, gold medals awarded at the 50
Ammonia, hartshorn, to make water of 49
Animal life in water 274
Animals, fattening 114
Animals, 74, 91
Annihilator, Phillip's fire 332
Antimony, preparation of 12
Ape, fossil 28
Apple paring machine, Weed's 2 engs. 84
Aqueduct, Croton 146
Arithmetical table, Allen's, 2 engs. 161
Arrowroot culture in Fla. 378
Art, discoveries in 20
Arts, the 365
Ashes, hard coal 400
Association for the advancement of science, American 394, 402
Asphaltum of New Brunswick 314
Asphyxia 328
Associations, mechanics 301
Asthma 209
Astronomy, eng. 176, 376
Atlanta, Ga., 36
Atlantic in five days, how to cross the 23, 275, 283
Atmosphere, the 179
Augur 372
Augur handles, Larkin's, 2 engs. 385
Anorora borealis 91
Autographs 217
Axle, Smith's ball 99
Axle box 220
Axles of carriages, circle bearing for the 4

B
Bagasse, apparatus for drying 384
Bagging, cotton 292
Bakatas of South Africa, 412
Banvard 2
Bald heads 18
Balloon, frozen 51
Balloon ascension, 2, 396
Barometer, extraordinary 296
Bath, Essex's, eng. 60
Bath, foot operating 340
Bearing, artificial 164
Beavers, 14
Bedstead 340
Bedstead, cot and camp 76
Bedstead fastenings, Taylor's 3 engs. 172
Bee, cultivating the honey 163
Bees, mathematics of 312
Beehive, Wheeler's eclectic, 5 Engs. 236
Beehouse, floating 40
Beeswax, to purify 57
Beer, to make table 249
Birds, value of 14
Bird, honey 395
Biscuit machinery 84
Blind, light for the 50
Blind, machine for the use of the 276
Blowpipe, the 61
Blowpipe, Cook's, 4 engs. 185
188
Blowing machinery, 2 engs. 92
Boats, life 356
Boilers, copper 212
Boiler, steam 202
Boiler explosion 234
Boiler incrustations, steam 74
Boiler invention, steam 324
Boiler safety apparatus, steam 180
Boot uppers, Sampson's apparatus for shaping, eng. 281
Borax 342
Boring machines, Jones' 29
Boring and morticing machine, Swingle's 29
Boring bedposts, Hall's machinery for 2 engs. 97
Boring and sinking machinery for artesian wells, Gard's 4 engs. 137
Botany of the Platte river 11
Brace, sash 364
Brain 373
Brain, phenomena of the 99
Brain injury, case of 339
Brakes for RR. cars and other machinery, Kimball's & Rice's hanging, eng. 308
Brass 363
Brass castings, 164
Bread, sash 365
Bread, soup 84
Bread, to make good 297
Brick machine, Wagner's 2 engs. 401

C
Bricks, hollow 364
Bride, safety 92
Bridge, RR. 273
Bridge, Britannia tubular 2, 68, 180
Bridge, Lewiston suspension 242
Bridge, Remington's 84, 148, 212, 322, 348
Bridge, Levenson's iron 29
Bridge, wire suspension 218
Bridge, wooden suspension 52
Bronze 296
Bruises and sprains 8
Brunel, biography of 189
Buckle, Scarlett's, 3 engs. 297
Burg cutting tool 212
Burns 8, 200
Butter, 193
Butter, American 26
Butter, to preserve 113

C
Cabbage, to preserve 81
Calculating machine 92
California 274
California gold region 139
Caloric, solvent properties of 310
Camomile 57
Camphene 46, 253
Camphor on the teeth, effects of 186
Canalton 10
Canal across the Isthmus of Panama 219
Canals, steam on 76
Cancer, cure of 81, 153, 226, 305
Cancer cured 338
Candles 345
Candles, Brown's apparatus for making mould, 3 engs. 164
Candles made by railway process 140
Candles manufacture of 68
Caoutchoucine 72
Car, RR. hand 97
Car hoister, Prime's, 2 engs. 241
Car wheels 52
Carbon 372
Carbon, properties of 104
Carbon as food for plants 194
Carding wool 316
Camellia, yellow 256
Carmine 12
Carding 412
Carpets 412
Carpets, weaving tapestry 44
Carriage making in N. J. 386
Casks, purification of 109
Casting, gun 23
Catsup, buttnerut 113
Cattle, feeding 43
Cautic, lunar 233
Caveat, a 157
Cement for mastic work 10
Cement for mending steam boilers 1
Chair, RR. 100

C
Chair, Van Anden's RR., 2 engs. 388
Challenge to the mechanical world 301
Charcoal melted, 268, 301
Charter, first RR. 329
Charts, Maury's 252
Cheese, Ohio 18
Chemistry, agricultural 69
Chemistry, animal and vegetable 113
Chemical discovery, great 13
Chemical philosophy 333
Chestnuts, planting 42
Chimneys, construction of 227
Chimneys, cure for smoky 121, 260
Chimneys, method of preventing the fracture in glass 12
Chloroform, effects of 66
Chloroform, employment of 272
Chloroform, to arrest the fatal effects of 172
Chloroform on plants, effects of 172
Chocolate 114
Cholera 3
Cholera, theory of 138
Choleretic discovery 46
Chrome 316
Chromatype 308
Chrono thermal medicine 153
Chronograph, electro 84
Chronometers, atreted, how 189
Chrysanthemum, the 99
Churn 76, 348
Churn, Davis's self adjusting, eng. 308
Churn, Robbin's telegraph, 2 engs. 156
Churns, labor saving 140
Cisterns, charcoal for 306
Clairvoyants 82
Claret, Texas 226
Clasp, Rockwell's bedclothes, 2 engs. 220
Cleaner, buckwheat 68
Cleaner, rice 372
Cleanliness, Paristan 3
Cleaning machine, Harris and Son's grain, 2 engs. 385
Climate 376
Clock, alarm 156, 188
Clock, astronomical 106
Clock, Lock's magnetic 44
Clock, novel 300
Clock, singular 260
Clock faces, to silver 153
Cloth, incombustible 124
Cloth, stercoric 348
Cloth, vulcanized india rubber 147
Cloth, waterproof 105
Cloth folding machine, Carey and Bagley's, 2 engs. 41
Clothes, washing 121
Clothes without seams 172
Clutch for machinery, Barlow's, eng. 273
Coal 130

C
Coal, Ala. 50
Coal, N. Y. 45
Coal breaker, Battin's 222
Coal formations 390
Coating ships 268
Cochineal to dye silk 32
Cocoanut, manufactures from the 292
Cocoanut, the Jamaica 330
Coffee, benefits of 331
Coffee, dandelion 225
Coffee, Java 115
Coffee, substitute for 281
Coffee West India 49
Coffee extracts, method of making, eng. 140
Coffee for weak stomachs 321
Colds, cure for 269
Coloring matter 329
Colors 400
Combinations, heat of 67
Combustion, spontaneous 243
Comet, the 346, 387
Compass, variation of the 412
Compound, disinfecting 332
Computing machine, Farnelec's eng. 364
Contentment 202
Convention, World's 196
Cook without fire, to 14
Cooking, errors in 376
Cooking by gas 389
Cooler, bed 44
Cop spinner, Dodge's 29
Copper, Lake Superior 390
Copper mines, Lake Superior 30
Corn sheller 76
Corn sheller, Harris and Carter's, 2 eng. 121
Cernices, wooden 372
Corrosive sublimate, counteracting the effects of 400
Cotton, nankcen 66
Cotton, cultivating 386
Cotton batting machinery, Essex's, Eng. 244
Cotton crop, the 410
Cotton drying machine 4
Cotton, experiment in Australia 35
Cotton factory, first 42
Cotton gin, Dubois' 21
Cotton gin, experiments with the 6
Cotton gin, Parkhurst's 130
Cotton machinery 100
Cotton manufacture in the U. S. the 355, 363, 371
Coupling, self-acting 252
Coupling, Brown's, 2 engs. 332
Cracker baking 68
Cracker machinery, Nevin's, 2 engs. 305
Crank and pulley, the 412
Crank, against the 6, 115
Crank, for the 14
Crank, on the 96
Crank, properties of the 125, 141

C
Cream, shaving 140
Croup, cure for 193
Crystals, sulphurous acid 146
Cultivator, Rodger's, eng. 340
Curiosity, natural 10
Curve, Schiele's anti-friction, 2 engs. 289, 292
Custards without eggs 225
Cutlery, to glaze 8
Cutter, straw 4
Cutter, Berthoff's straw, eng. 52
Cutter, Hovey's straw 124
Cutter, Macomber's straw, 2 engs. 396
Cylinder, bursting of the Brahmah 54

D
Daguerreotype 192
Daguerreotype, oil painting 20
Daguerreotype cases 324
Daguerreotype improvement 276
Damasus blades, manufacture of the 137
Dam at Hadley Falls 58
Damp, fire 381
Dead Sea, the 283
Deafness, remedy for 185
Depositing machinery, Brooman's, 2 engs. 321
Detector, alarm and thief 180
Diamond, wonderful 368
Diamonds 370
Diamonds, artificial 325
Diamonds, manufacture of 302
Diamonds, value of 363
Diet 354
Diet, vegetable 285
Discovery, important 67, 75, 83, 123
Discovery, poetry of 77
Discovery, simplicity of 13
Discoveries, Layard's 283
Dishes, washing 164
Distributor, Morse's air, eng. 268
Docks, foundation of 188
Dog bites 2
Down of the Eider duck 136
Dragon blood plant, the 364
Drawing pencil 190
Drawing made easy, eng. 5
Dressing machine, Wilson's stone, 2 engs. 284
Drill, Ide's grain, 3 engs. 372
Dropsy, cure for 338
Drowning, to treat cases of 12
Dryer, grain 244
Dryer, Sneed's grain, 2 engs. 257, 260
Dyeing 180
Dyeing blue, yellow and black, 48

E
Eggs, clarification of 89
Eggs in China, hatching 338
Electric batteries 54

Electric clock, illuminated dial 192
Electric light 76
Electric light, effects of the 200
Electric light, Gillard's 341
Electric light, Paine's 61, 85, 93, 98, 203, 268, 317, 324, 332, 341, 355, 365, 371
Electric telegraph batteries 276
Electric waves, velocity of 69
Electric and artificial light 158
Electricity, blowing up wrecks by 131
Electricity, discoveries in 28
Electricity, theories of 11, 19
Electricity, velocity of 376
Electricity and the atmosphere, 75
Electrical phenomenon 142
Electro magnetism as a motive power 339, 388
Electrotyping, eng. 140
Electricity 384
Enamels 80
Encyclopedia, iconographic 117
Engine, alcoholic vapor 37
Engine, Brown's anti-crank, 2 engs. 316
Engine, condensing 364
Engine, fire 124
Engine, Hubbell's Solar Magnetic, 10 engs. 377, 378, 379, 380
Engine, marine steam 49
Engines, steam 412
Engine, steam and water 341
Engine, water pressure 220
Engine experiments, steam 35
Engine improvements, steam 364
Engine instruments, steam 57
Engines, rotary 132, 277, 356
Engineers, institution of civil 381
Epidemics rage at night, why 334
Equator, the 72
Ewbank 370
Excavating machinery, 2 engs. 169
Exploration 50
Explosion, singular 174
Explosions, steam boiler, eng. 173, 181, 192, 349, 384
Explosions, to prevent 203
Eye, the 8
Exhibition, industrial 413

Factories, cotton 266
Fainting 8
Fair, Chicago Mechanics' 10
Fair, Industrial 29
Fair, N. Y. State 2, 413
Fair of the American Institute 29, 37, 45
Fastener, window 196
Fastener, Page's window, eng. 45, 52
Feathers, purifying 36
Felon, cure for 185, 219
Fence, Leavensworth's wire, 2 engs. 156
Filter, water 236
Fire, fountain of 273
Firearm, improved 36
Firearms, Prussian 12
Fire bottle, phosphoric 273
Fish, the sword 326
Fish, to pickle 297
Flag syrup 12
Flag culture, the 210
Flax made to resemble cotton 363
Flax manufacture, the 383
Flesh, vegetable 139
Flour 374
Flour, oat 36
Flour and meal, Stafford's 45
Flour making 20
Flower amalgamation 2
Flowers, blowing of 393
Flowers, artificial 99
Flowers, colors on 112
Fluids, experiments on the explosion of burning 200
Flying machine 340
Fodder for animals 170
Folder, newspaper 108
Folder for pipes 124
Folding machine, cloth 20
Forceps for gun shots 84
Forgeries, foreign 269
Forks 256
Fortification, Egyptian 147
Founder in horses, curing 34
Franklin 131
Franklin, Sir John 2
Franklin Institute 52
Freezer, Masser's ice cream 2 engs. 60
Fruit in Russia 10
Fruit trees, low headed 241
Fuel, artificial 69
Fuel in Paris 4
Fulton 267
Furnace, Barron & Bro.'s blast 3 engs. 28
Furnace, Griffin's boiler 378
Furnace, Palmer's Russian, 2 engs. 28
Furnace, Salter's iron 116
Furnaces, invention in 52

Galvanic battery 11
Gas, Brown's water 220
Gas, carbonic acid 118
Gas, hydrogen 37
Gas, new kind of 164
Gas, N. Y. 13
Gas, oilfent 384
Gas, price of 98
Gas, water and coal 371
Gas consumers, meeting of 165
Gas from water 388
Gas lamps, spirit, 4 engs., 145

Gas light, the hydrogen 389
Gasometer 92
Gate, Smith's Vertical Parallel 37
Gearing, Chapin's Lathe, Eng. 108
Genius 202
Geology of Fla. 165
Ginning machine wanted, cotton 244
Girder, iron 286
Girder, Boyan's Arch, 5 engs. 324, 329
Glass, plate 404
Glass, gold and silver 396
Glass, pictures on 28
Glue, marine 1
Gold, artificial 153
Gold formations 402
Gold, characteristics of 189
Gold, chlorides of 33, 129
Gold, imitation of 356
Gold, refining of 232, 348
Gold in the arctic regions 189
Gold washing in S. C. 128
Grafting 90
Grapes, American 65
Grapes, California 59
Grapes, to preserve 41
Grapevines, grafting 208
Grapevine in the U. S., the largest 412
Grass Cutting Machine, Adkin's 2 engs. 12
Gravity 409
Grease, axle 401
Grease, removing 393
Grindstones, Nova Scotia 59
Guano 204
Gulf stream, the 222
Guns, 44, 72, 92
Guns, air 188
Guns, Shaw's Air, 4 engs. 273
Guns, air vs. Rifles 227
Gunnery 112
Gunpowder 261
Gutta percha in medicine 372
Gutta percha solutions 12

Hadley Falls, city of, eng. 82, 187
Hail 168
Hallucination, drugs for producing 237
Hammers, steam 389
Hams, beef 105
Hams, saving 300
Hams, to keep smoked 41, 118
Hardening, case 272
Hardening, common 259
Harpoon, Hales electric, eng. 404
Harpoon, Brown's, 4 engs. 356
Hats, to clean straw 204
Headaches 4
Health 33
Heat, magnetization of 91
Heat, properties of heat in combination with steam, 2 engs. 179, 195
Heat expands bodies 10
Hedges, hemlock for 50
Height and distances, deception of vision in 189
Hemp brake 188
History, natural 3, 4
Honey 112
Hook, bench, 268
Hogs 147
Hogs, to cure swelled throat in 65
Horn, animal 152
Horse, the 14
Horse power 274
Horse power, Bogardus's 298
Horse power at different rates of speed, table of 200
Horses, to feed 65
Horses from carriages, to detach 68
Houses, building 196
Hydrants 76, 196
Hydrants, cast iron 108
Hydrants, Gee & Tabeles, eng. 188
Hydrogen, phosphorette 273
Hydrophobia 106
Hygrometer, register, 348
Hysterics 8

Ibis, black Egyptian 304
Ice, manufacture of 220
Ice machine 140
Ice made by mechanical power 3
Impulsoria 340
India rubber, solvents for 393
Indigo, American 35
Inflammation 8
Information, useful 5
Infusoria on teeth 338
Ingenuity, waste of 171
Ink, green, yellow, red, japan, and writing 265
Ink, lithographers 332
Ink, new kind of 308
Ink, printing 17
Ink for marking linen 17
Ink that resists the action of acids, 332
Ink powder, Russian 265
Insects 169
Instinct 290
Interest table, sliding scale 108
Intoxication, Swedish laws with respect to 43
Inventors, original 75
Inventors, hall for 341
Inventors and patent agents 182
Invention 197
Invention extraordinary 76
Invention, foreign 92
Invention, progress of 80, 373
Inventions, lost 316
Inventions, piracy of 133

Iron, chemical constituents of 328
Iron, foreign R. R. 1
Burden vs. Corning & Winslow 358
Byam vs. Brooks 236
Coffee vs. Branton 21
Day vs. Ward 309
Day vs. Woodworth 106
Lampman vs. Adams 318
Mason vs. Talman 374, 382
Parker vs. Brant 205, 212, 261
Parke vs. Hulme 85
Spaulding vs. Eastman 94
Tatman vs. Leeroy & Smith 77
Troy nail factory vs. Corning & others 222
Wilson vs. Barnum 61, 70, 79, 85, 86, 94, 102, 107, 269
Wilder vs. Herring 85
Iron, Dicken's process of making 148
Iron, origin of malleable 368
Iron, phosphorus of 54
Iron, planing 284
Iron, shingling 259
Iron, silencing 64
Iron, Thompson's improvements in the manufacture of, 2 engs. 217
Iron, to prevent oxidation of 56
Iron, welding 259
Iron and steel, manufacture of finer 59
Iron vessels, glazing 401
Iron with copper, coating 396
Iron and zinc, Franklinite of 203
Iron business of Penn. 378
Iron convention 56
Iron, copper and cobalt by caustic potash, solubility of 11
Iron into steel, converting 44, 259
Iron manufacture, the 44, 83, 100, 157, 219, 236
Iron moulding, 29 engs. 8, 16, 24, 32, 40, 48, 56
Iron ore into malleable iron, reducing 272
Iron or steel, to gild 153
Iron vessels by fusion, mending 372

Jelly, biscuit 1
Jelly, to make pomade or bread 1
Jewellers and their ferges, Cin-galese 35
Jigger, shoemaker's 324
Joint, elastic 156
Jordan, rapids of the 374
Journal box 36

Kerasophany, art of 236
Knitting 288
Knives, grinding spiral 412
Knobs, door 244
Knobs, Kirkham's door, eng. 257
Knocking, spiritual 163

Labor lost 45
Lace makers and lace making 392
Lamps, blowpipe and heating apparatus, Anderson's alcoholic self-generating, eng. 44
Lamps 357
Lamps, solar 37
Lantern 196
Lard and oil business of Cincinnati 18
Lasts, shoe 148
Lathe, Alcott's wood turning, 2 engs. 57
Lathe machine 388
Lathes, Harrison's 29
Lathe's, Hill's 29
Lathe's, Scranton & Parshley 45
Lead, handling moulden 331
Lead, to make tea lead into 16
Leather 242
Leather, manufacture of varnished 401
Leather preservatives 26
Leeches, to preserve 33
Leech, artificial 396
Leg, Palmer's patent 169
Leg, Yerger's artificial, eng. 60, 100
Legs, artificial 370
Light, Gillard's 381
Light, irradiation of 290
Light and heat from water 383
Light and its effects 309
Light for R. R. 41
Lightning rods 394
Lightning and lightning conductors 336, 344, 352, 360
Limbs, artificial 300
Lime, hypo-sulphite of 304
Lime, soda and chloride of 370
Lime burning, 5 engs. 64, 93
Linen loom, steam 12
Linen vs. cotton 123
Liquid, lubricating, 372
Lock machine, Stowe's, 2 engs. 204
Locks 37
Locks, Goffin's pad, 3 engs. 393
Locks superseded, canal 340
Locomotive, improved 52
Locomotive, new 164, 242, 348
Locomotive engines, coal in 198
Locomotives for ascending inclined planes controversy 277
Log and board measure, Hutchinson's, 2 engs. 345
Loom, power 372
Loom, the hand loom and power 179
Looms, improvement in 212, 252

Lumber trade in Maine 267
Machinery, Agricultural 397
Madder 82
Madder or wool, to dye 32
Mahogany, to imitate 282
Malaria 366
Mallet, serving 308
Mangle, domestic, 2 engs. 353
Manna, fall of 66
Manufactures, Southern 322
Manufacturers, to 316
Manure 340
Manure, bran for 280
Marble polishing 342
Marine, national steam 357
Mask, antique gold 264
Matches 76
Matches, composition of friction 145
Matching machines 68
Matter, division of 88, 310
Matteawan 253
Mattress 108
Mattress, spring 43
Mattresses, life preserving 364
Meat, to preserve 81
Meat, to cook frozen 145
Meat chopper 4
Mechanics, philosophy of, 2 engs. 291, 299, 307, 315, 323
Mechanics in Germany 43
Mechanical fancy 2
Mediterranean, the 299
Melodeon, Swan's parlor, 2 engs. 228
Men with tails 19
Meridian, an American prime 11
Mesmerism 320
Metals, experiments with 392
Measure, tailor's Eng 393
Metals, experiments with 392
Metals, fusibility, etc. of 31
Metals, joining 324
Metals, molten 219
Milk, adulterated 10
Mill stone, burr 253
Mill driven by artesian wells 408
Mineral waters, nitrogen in 67
Mortising machine, Swingle's, eng. 113
Mormon city of Salt Lake 43
Mortecotype 268
Mote from the eye, to remove 73
Mummy, unrolling a 274
Murrin in cattle 108
Music, revolution in 21
Music in man 203
Musk, to destroy the smell of 1
Muslin, glaze for 369

Nail machine 124
Nankeen, to color 376, 384
Narcotics 313
Natural history, facts in 336
Nautical instrument 356
Navigating shallow rivers 12
Navigating the air 13, 16, 172, 261
Navigation, canal 116
Navigation, steam 251
Needles, drilled eyed 276
Nicaragua, lake 201
Nickel and cobalt from their oxides, to separate 11
Ninevite remains 363
Numerals, Indian 314

Oatmeal 60, 224
Ocean, color of the 266
Ocean, depth of the 46, 77, 91
Ocean, sounding the 69
Ostrich hunting 398
Oddfellows 18
Ohio, steamship 2
Oils 99
Oil, linseed 48
Opium 13
Opium trade, the 249, 299
Optical instrument 84
Optical invention 172
Opticians, self made 35
Orange tree, the 6
Oregon 42
Ore veins, metallic 83
Ores, mineral 24
Oven, newly constructed 180
Oyster, light from the 42
Oyster opener, Picault's, eng. 348
Oysters, machine for opening 12

Pacific, road to 9, 33
Packing, metallic 356
Paddles for canals 91
Paint, metallic 301
Paint, the using of 293
Painter, first American 293
Painting, cleanliness in working in 304
Paper, fire proof 260
Paper, talbotype 257
Paper, tracing 373
Paper, transfer 332
Paper machine, Bohl's, 2 engs. 225
Parsneps 129
Patents 221
Patents, infringement of 91
Patent cases, trial by jury in 22, 30, 38, 46
Patent Cases—
Aiken vs. Foster 61
Blanchard vs. Reeves and others 403
Blanchard Gun Stock Company vs. Eldridge 107, 212
Bloomer vs. Curtius & Rine 202
Bloomer vs. Dilworth 358

Winnans vs. Troy R. R. Co. 341
Patent fund, the 150
Patent laws 77, 93, 115, 205
Patent laws, reform of the 205, 221, 229, 270, 307, 317, 350, 366
Patent office, powers of the 357
Patent office, report of the Secretary of the Interior about the 134
Patent office report 149, 154
Patent rights 302
Patentable subjects 365
Paving streets 3 engs. 229, 252, 298
Peach trees, decay of 314
Pearls, to make 345
Peat, distillation of 69
Pegged shoes, invention of 242
Pencils, black lead 356
Pencils, manuf. of black lead 356
Pencil cases 132
Percussion cap machine 245, 253
Perpetual motion 116, 140
Perspiration 309
Petrification 312
Phosphoric, solar 101
Phosphurets 273
Photography 347
Piano 12, 37
Pianoforte Grays & Boardman 2 engs. 65
Pie, fig 385
Pigs, parsneps for 306
Piles, treatment of 195
Pile driver, Foster's, 3 engs. 373
Pile driving, pneumatic 173
Pile driving, Pott's Pneumatic 2 engs. 161
Pinchbeck 153
Pine to imitate black walnut, to color 209
Pipes, glass water 332
Pipes, sheet iron 244
Pipes for telegraphs, chain 54
Pipes with glass, coating iron 356
Pipes without cores, Shank's moulding 2 engs. 81
Pitchforks 292
Planetary system, the 82
Plaster, court 412
Planing machine, Allen's, eng. 404
Planing machinery, Adams' new dog for, eng. 57
Planing machine, Woodbury's 61
Planing machine, Woodworth's 366
Planing short boards, machine for 364
Planing, tonguing, and grooving machines 4 engs. 337
Plank roads 209, 254, 267, 339
Planter, corn 68
Planter, Flory's seed 2 engs. 265
Planter, Groshon's corn, eng. 313
Plate manufacturing, tin 253
Platina, imitation of 356
Platinum 96
Plow, Baker's, 2 engs. 348
Plow, Cuban 180
Plow, origin of the 236
Plow, submarine 92
Plow stock, wrought iron 276
Plug for boilers, fusible 229, 267
Poison, manchineel 42
Poison-balls 312
Poisonous bites 8
Polish, French 400
Pork, preserving 356
Porter, to make 249
Postage reform 322
Potash, chromate of 328
Potatoes 97, 347
Potatoes, boiling 153
Potatoes, substitute for 153
Pottery, glazes for 57
Powder, explosive 228
Powder, violet 385
Powder of cassius, purple 25
Presidents death, the 319
Press, Brown's eccentric progressive power 3 engs. 196, 313
Press, Dick's anti friction 3 engs. 220
Press, French printing 223
Press, Brown's eccentric tobacco, 2 engs. 412
Press, hydraulic 189
Press, printing 63, 103
Printing, calico 108
Printing, chemotype 51
Printing, chinese 179
Printing, woollen 220
Printing improvement 316
Projectile for cutting rigging of vessels 2 engs. 340
Propeller, new 44, 180, 314
Propeller, Wilcox's amphibious, eng. 244
Propeller, single blade 140
Propeller for canals 182
Propeller improvements 207
Propellers, history of, 84 engs. 3, 72, 80, 88, 96, 104, 112, 120, 128, 136, 144, 152, 160, 168, 176, 184, 192, 200, 208, 216, 224, 232, 240, 248, 256, 264, 272, 280, 288, 296, 304, 312, 320, 328, 336, 344, 352, 360, 368, 376, 384, 392, 400, 408
Propellers, report 22, 27
Propulsion, effects of 267
Propulsion, method of 228
Provisions for field hands 386
Psychological discovery 100
Pulley and the crank, the 178
Pump, force 84
Pump, Jeffery's, eng. 76
Pump, Kease's force 3 engs. 212
Pump, Read's atmospheric lifting, eng. 85
Pump, ship 212

Pump, Von Schmidt's centrifugal 2 engs. 148
Pumps, Gibb's 3 engs. 105
Pumps, packing for, eng. 28
Pumping apparatus 292
Purple, Tyrian 245
Putty, to soften 33

Quadrature of the circle 354, 410
Quilt, great 92
Quinine, to take 5

Races, the 74
R.R. travelling 397
Rain, formation of 406
Race, unity of the human 402
Rails, cast and wrought iron 204

Railroads
Albany 209
Ala. 177, 217, 321
Atlanta 337
Auburn 89
Balt. 169, 313
Boston 57
Buffalo 398
Cayuga 113
Cleveland 353
Charleston 217
Chicago 377
Conoco rd 297
Ct. River 281
Covington 169
De Grands 185
Erie 105
Ga. 297, 305, 361
Girard 369
Hudson River 9, 25, 113, 153, 265
Ind. 305
Miss. 385
Mobile 201, 241, 281
Mohawk 129
N. J. 1, 361
N. Y. 1
N. A. Colony 393
Nashville 393
N. C. 313
Ohio 145, 159, 249, 353, 360
Pacific 41, 233, 305, 353
Panama 41
Pittsburgh 89
Portland 385
Reading 281
Rome 105
Rutland 89
Tehuantepec 31
Toronto 353
Troy 289
Whitney's 329
Wilmington 73
Worcester 17
East Indies 225
Engle 25, 49
Ind. 193
Mich. 73
Pa. 57
Baltimore 388
Helical 252
Merrill's 308

Railway errors 221
Railways, magnetic action of 75
Railways in cities, eng. 101, 116, 153
Ram, hydraulic 45
Rain, causes of 330
Rats, to destroy 97, 240, 305
Rat trap 156
Rattlesnake adventure 18
Rattlesnake hunter 10
Razor strip, to make a good 297
Reaping, new plan of 20
Reaping machine 356
Reaping, threshing, and separating machine, Rembert's 4 engs. 33, 36
Rennet, to prepare 65
Respiration 157, 208
Respirator and inhaler 236
Revolutions, real 21
Rice, Mo. 72
Rice, old 306
Rifle, Sharp's breech loading 3 engs. 193
Rifle, the Prussian 5 engs. 124
Ringworm, to cure 240
Roaches, to exterminate 305
Roads, machine for repairing 132
Rocks, substitute for blowing 386
Rolling irregular forms of metal, Hall's mach. for, 3 engs. 209
Roofing, tin 196
Roofs, new 406
Rope, trial of 50
Rosin for fuel 164
Rosin and lard, compound of 394
Rotary engine, great 36
Rothschilde, the 296
Russia, wealth of 10

Saddles 260
Saddles, Fisher's 4 engs. 276
Saguenay River 150
Salines in Onondaga 110
Salt, medical use of 202
Salt, deposits of common 402
Salts, smelling 49
Saltpetre 345
Sap in trees, rise and fall of 43
Sarsaparilla 75
Sash supporter 252
Saws, circular 284
Saw mills 68, 156
Saw mills, self acting 389
Sawing irregular pieces of timber, machinery for 4
Sawing ship timber, Wright's machinery for 2 engs. 17
Schools, evening 21

- Scales, Flint's computing, eng. 100
Science, Paris academy of 254
Serpier, revolving road 20
Serpier, Sweet's excavating, 2 engs. 409
Screw machine 92
Scribing machine 220
Seas, depths of 291
Segars, self lighting 20
Sense and nonsense 325
Separator, Vose's buckwheat 2 engs. 8
Sewing machine, Lerow and Blodgett's, 3 engs. 1.
Sewing machine, Watson's 3 engs. 369
Sewing machine, Wilson's 2 engs. 73
Shaheen 35
Shawls, cashmere 216
Shears, Dick's anti friction 2 engs. 249
Sheathing, zinc 212
Sheepskins, to color 133, 125
Shingle machine 268
Shingle and stave machine, Wood's, eng. 180
Shipwreck, apparatus for saving life in case of 44
Ships of war, iron 396
Shoes without nails, horse 244
Shot, red hot 36
Shot, to manuf., eng. 132
Shot on iron vessels, experiment with 363
Shutters, opening and closing window 124
Sifter, tobacco 336
Sight, restoring and preserving 389
Silk, to keep 17
Silk machine, doubling and twisting 228
Silk manufactory in Mass. 292
Silks and teas of Japan 274
Silkworms 112
Silkworms, feeding 340
Sills, cast iron 260
Silver, acetate of 240
Silver, detaching 233
Silver, nitric solution of 233
Silver, solder for 233
Silver, sulphate of 240
Silver gilt plate 233
Slate, American 58
Sleep 211
Sleeper, iron 97
Sleepers, R. R. 372
Slitting machine 76
Smithsonian Institute 122
Smoke, consumption of 252, 261
Smut machine 161
Smut machine, Buel & Brown's, eng. 300
Smut machine, Gordon & Gould-thrite's, 3 engs. 129
Smut machine, Goshon's 4 engs. 233
Snath, scythe 404
Snow, artificial 281
Soap, labor saving 145
Soils 46
Solder for steel joints 49
Solar system, magnetic principles of the 410
Sound, sympathies of 6
Sound and electricity, transmission of 19
Soap, pumpkin 89
Spain 139
Spark arrester, Ladd & Iver's 2 engs. 20
Spark arrester, Radley's 2 engs. 44
Spark arresters, improvements in 4
Speeches, machine for reporting 108
Spiders 72
Spine disease, cure of 240
Spindle bearing, eng. 101
Spinning frame, the thistle 180
Spoke shave 212
Sponge fishing 34
Spring, wagon 20
Spring, Warren's 45
Spring in Ala. rumbling 54
Springs, pearlash 26
Stammering 241
Stammering, cure for 172, 201
Starch manufactory 274
Stave and shingle machinery 52
Stave cutter, jointer, shingle, and barrel head machine, Hutchinson's, 4 engs. 9
Steam 211
Steam, elastic force of 38
Steam, experiments in 67
Steam, report on the alleged discovery of new properties of 24
Steam, surcharged 143
Steamers, Atlantic 293
Steamboat regulations 13
Steel, American 66
Steel, hardening 256
Steel, American cast 10
Steel, English cast 259
Steel and iron, to make edge tools from 272
Steering apparatus 284
Steering apparatus, Brown's 2 engs. 297
Steering apparatus of the Asia 300
Stephensons, the 243
Stereotype process, the 243
Stone, oil 305
Stone, square 164
Stone, cooking 316
Stove, Jackson's cooking, eng. 329
Stoves and heating rooms 45
Straw for hats 289
Strength, human 280
Stuffing box, Shock's anti friction, 3 engs. 361
Sugar, acetate of 304
Sugar, preparation of 36
Sugar, manuf. of 60, 84, 100, 117, 163, 171, 568, 298, 360
Sugar, refining of 59, 324
Sugar, Clement's improvement in the manuf. of, eng. 68
Sugar, Benson & Day's apparatus for evaporating in the manuf. of, eng. 113
Sugar and its uses 267
Sugar discovery 44
Sugar making, Nelson's process of 156
Sugar manufactory machine 92
Sulphur 104
Superstitions, Egyptian 392
Surgical operations 34
Swimming feats 19
Switch R. R. 3, 381
Syrup, lemon 249
Syrup, peppermint 249
Syrup, rhubarb 49, 249
T
Table improvement 108
Tan, to decompose old 217
Tanning 349
Tanning, discovery in 154
Tanning, leather 120, 128, 136, 144, 152, 160, 168, 176, 184, 192, 203, 216, 224, 232, 240, 248, 256
Tam-Tam 48
Tea, American 11
Tea culture 139
Tea culture in S. C. 286
Tea nuts 363
Tea plant in America, the 136
Telegraph, Dyer and Calais 44
Telegraph, electric 154
Telegraph, Hanley's Magnetic Electric 344
Telegraph, Transatlantic 260
Telegraph, working of the 149
Telegraph invention 152
Telegraph feats 75, 91, 110
Telegraph in Europe, electric 412
Telegraphing, marvellous 396
Telescope, the 184
Telescope, Ross's 352
Telescope, water 20, 339
Telescope examiner, Day's Submarine 3 engs. 25
Terra Cotta 388
Theories, Epsay's 370
Thermometer, history and construction of the 395, 403, 410
Tides 259
Tides, effects of 222
Tides, polar origin of 200
Timber 22
Tinning metal 49
Tires for wheels, Gutta Percha 100
Tobacco, preserving 313
Tobacco, substitute for 92
Tobacco planting in N. Y. 344
Tonnage of ship, to find 409
Tongueing and grooving machinery, Kittle's 2 engs. 153
Trap, lighthouse bird 9
Tree, beautiful 51
Trees, transplanting 14, 121
Trial, R. R. 2
Trout, catching 323
Tube, blasting wedge 244
Tubing, Gutta Percha 196
Tunnel, Great 1, 41, 42
Tunnel, Blue Ridge 41
Tunnel on the Balt. R. R. 321
Tunnelling the Alps 268, 323
Turning machine, wooden bowl, Everett's, eng. 409
Turpentine, oil of 27
Turpentine cure for poison, spirits of 392
Twins, Siamese 395
Types 211, 320
U
Universe, the 114
V
Vaccination, re- 228
Vaginal supporter, Caulkin's Intro 2 engs. 252
Valve, duplex safety, eng. 356
Valves, steam engine 108
Varnish, copal 145
Varnish, pale 146
Vatican at Rome 34
Vegetable sensibility 64
Vegetarians, for 337, 353, 361
Ventilation 72
Ventilation, discovery of 37
Ventilator, ship 85
Vesuvius, eruption of 264
Vice, Cowle's parallel, eng. 28
Vices, Tolman's screw and collar for 3 engs. 281
Vinegar, wine 171
Vitriol, drinking 340
Volcanoes 282
W
Wagons and carriages, construction of 52
Wagons and carts 14
Walls of buildings 4 engs. 277, 285
Walls, preventing damp in 229
Ware vessels 166
Warts 49
Washing, receipts for 6, 99, 146, 288
Water, information about 357
Water, spheroidal state of 272
Water, to purify sea 358
Water vs. steam power 387
Water closet, Ingram's, eng. 398
Water melon rine preserves 17
Waterspout 360
Watt, James 250
Webber, the, eng. 49
Wedge, lifting 396
Weevils, to get rid of grain 305
Welding 104
Wells, artesian 51, 66
Wells, to purify 313
Whales, invention for capturing 252
Whaling business, the 146
Wheel, bucket 37
Wheel, Fowler's wagon 2 engs. 116
Wheel, hydro steam 37
Wheel, paddle 36
Wheels, carriage 76
Wheels, centre of gyration of 147
Wheels, water 68, 131, 155, 373
Wheels, experiment with water 268
Wheel self-lifting water 396
Wheels, Collier's Water 3 engs. 201
Wheels, E. Parker's water 2 engs. 177
Wheels, Parker's Reaction Water 21, 315, 331
Wheels, reaction and percussion water 227 267
Wheels, Rich's Water 53
Wheels, Tinby's Turbine Water, eng. 20
Whitewash receipts 231, 298
Wine, current 318
Wine, Miss. 202
Windmill, Page's 20
Winds 29
Wood, to preserve 227
Woodworth patent, the 174, 189, 213, 236, 245
Woolens and furs 299
Words, origin of 387
World, design in the natural 35
World's exhibition, the 251, 262, 286, 365, 390, 405
Worm, to destroy wire 74
Wounds 3
Z
Zinc, N. J. 45
Zinc, Red Oxide of 291
Zinc as a paint, the oxide of 60
Zinc not injurious to health, use of oxide of 307
Zinc paint 98
Zinc ore, N. J. 5
PATENT CLAIMS.
Account books 94
Air heater 196
Arch girder 294
Anti-friction cam 294
Augurs for boring 86, 182
Axles for cars 206, 390
Barrell machine 182
Barrell carriages, 62
Ballot boxes 332
Ballrooms 226
Bed clothes clasp 182
Bedstead fasteners 278, 158, 190, 318, 110 2 cl.
Bedstead invalid's 206
Bedsteads 126, 150
Bedsteads sofa 86, 198, 302
Bedstead and table 86
Beehives 246
Bee moth traps 238
Bench hook 390
Beueller for washers 411
Billiard tables 126
Bits 382, 406
Blast pipes 238
Blast furnace 86
Blind shutter 134
Blind suspender 310
Boring machines 94, 142, 150
Borrd rule 270, 310
Boxes for axles 70, 389
Boilers steam 94, 214, 390, 389 2 cl.
Bolt, rivet machine 374
Boot trees 334
Bottle fastener 118
Boats in sections 126
Brick Presses 110, 310, 334, 159, 286 two cl., 166, 79, 86, 94
Brakes, pulleys for 79
Brakes, connection 134, 214
Bran dusters 118, 278
Breaking horses 411
Bridges truss for 262, 411
Branding tools 134
Buckles 102, 150, 286, 302
Buttons 118
Button varnish 190
Butter worker 94
Car wheels 126, 142, 238, 102, 79, 254, 230, 214, two cl., 406
Cars R. R. 206
Cars, plank road 315
Car ventilator 214, 310
Car seat backs, 374
Car coupling 110, 254, 411
Carpet cleaning 70
Capstans 142
Calculating machine 174
Calculating machines 174, 2 claims
Carding wool 318
Cast steel 246
Casting rolls 198, 294
Carriage bodies 182
Carriage bodies for roads 406, 334
Carriage tops 190, 2 claims
Carriage jacks 206
Cartridges 198
Cap front cutter 198
Candle moulds 158
Candle making 390
Calico printing 406
Calculating gypsum 326
Cans for oil 246
Castors 182
Churns 374 two claims, 278, 334, 319, 382, 198, 134, 142, 238 two claims, 118, 246, 230, 158, 262
Cheese presses 334, 238
Chimney caps 206, 246, 238
Chimney fire places, etc. 206
Chronometers 56
Chucks 158
Chairs nursery 214
Chairs exercising 226
Cider mills 150
Clay preparing 254
Clevia substitute 150
Clothespins 110, 236
Cloth shearing 302
Clothes frames 198
Cloth measurer 262, 198
Clover thresher, 342
Clover seed huller 190
Clutch 390
Coal stirrer 262, 246
Coal grates 134
Coal purifying 374
Corn shellers 70, 158
Corn and cob mill 294
Cord machine 102
Cordage cotton 142, 134
Cooking ranges, 102, 302, 206 two claims, 238
Cotton gins 262, 142
Cotton stalk cutter 182
Cotton press 153, 411
Cotton, batting, sizing, etc. 374
Coffee roaster 270
Coffee making 198
Copper tubes 302
Coupling for pipes 270 2 claims
Crank substitute 262
Cracker machine 389
Cultivator 334, 142
Cultivator teeth 238
Curry combs 182
Cut off valve 374
Daguerreotypes 270, 158
Dampers, stove 150
Dentist's chairs 238, 262, 374
Distilling 86, 198 two claims
Dividers, 246
Door springs 246, 206
Dough kneading 190
Drilling machine 262, 406
Drawing board 126
Drawing rollers 214
Dyeing apparatus 110
Earth borer 126
Embankments 318
Engines, steam 240, 142, 70, 278
Engines, magnetic 254
Engines, rotary, 118
Engines, vapor 102
Engines, fire 70
Engines, air 342
Engines hydraulic 150
Engines connecting rod 286
Enameling 206
Excavators 174, 278
Fastening for drawers 374
Fanning mills 2 claims 302
Fences 2 claims 190
Fire arms 326, 270, 79, 262 two claims, 102, 110, 118 2 claims, 238, 126 2 claims, 214, 389, 390, 406, 411
Fire extinguisher 246
Filters 234, 230, 94
File cutting 102
File supporter 70
File for papers 150
Figure burning 190
Figure cutting 214
Flour bolts, 166, 94
Flour dressing 94
Flour packers 62
Flour mills 214
Fly trap 254
Flutes 126
Flying horses 310
Flood gates 86
Flooding powder magazine 70
Fluid levels 246
Forks hay 206
Fountain pens 238
Fog bells 94
Frogs for R. R. 102, 234
Fringe twister 94
Furnaces 206, 158, 182
Furnaces for boilers 166
Furling mills 389
Gas making 166 two claim, 198
Gasometers 206
Gates 118, 382, 150
Gauges for plasters 270
Glucose 206
Gold washers 226, 262, 286
Gold amalgam 382, 342
Gold boiler 382
Grain harvester 342 two claims
Grain drills 142
Grain steaming 296
Grain dryers, 406, 270
Grates 406, 310
Grinding tools 110
Grinding machine 134
Gridiron valve 152
Guitar heads 254
Guage for casks 214
Gudgeon wings 246
Hames saddle 110, 214, 382
Hames 70, 110, 150, 246 2 claims
Hames rings 246
Hames, breast plate 190
Hames weavers 382
Harvesters 389, 118, 94, 150
Hammers 234 110
at bodies 230
at rim curling 79
Harpoons 310, 389, 411 two cl.
Head gearing 110
Hemp machinery 134, 126, 206, 86, 79, 118, 389, 102
Hemp, rotting 126
Heddles, wire 246
Hide breaking 254
Hinge, shutter 334
Hoisting mach. 230, 238
Horse rakes 182
Hooks and eyes 374
Hubs and axles 374, 110, 79, 86, 198, 334
Hydraulic regr. 246
Hydraulic blast 318
Hydraulic blower 254
Hydrolator 198, 270
Ice cream freezers 79, 134
India rubber rolling 230
India rubber manuf. 126 two claims, 230
India rubber springs 246
Indicator 118
Ink fountain 86
Iron, cast 126
Iron coating 142
Iron railings 198
Iron buildings 278
Iron manuf. 86
Jaw wrench 286
Jointing boards 302 two claims
Kilns for pottery 256
Lamps 262, 342, 406, 302
Lauterns 126
Spinner 266, 411
Lathes, turning 262, 70, 294
Lathe gearing 62
Lath render 278
Lead pipe 411
Leather dressing 79
Leather cutting 318
Leather stretcher 270
Leeches 278
Levels 342
Lever, Lewis 214
Legs, artificial 230
Lighting rods 174, 142
Looms 134, 86, 70, 62 two cl., 1206, 166, 310, 214, 334, 110, 294 two claims, 270 230
Locks 79, 150, 110, 234
Lock gates 294
Lock bolts 214
Loaded ball 198
Log setting 294
Lozenge cutter 342
Magnetic needles 238
Magnetic machine 310
Manure 166
Mantel piece 246
Marble machines 230
Mattresses 318, 246
Melodeons 278
Metal sheet tubes 230
Meat cutting 198
Metres water 174
Mills for grinding 166, 62 two claims, 150, 326, 102 two cl.
Milking cows 94
Mills, feeding 326
Mowing machine 70, 150
Morocco finisher 326
Musical instruments 294
Nail rolling 826
Noddle iron 214
Oil cans 246
Oil presses 214
Oil cloth printing 238
Omnibuses 406
Ore washer 142
Overshoes 278
Oxide of zinc 278
Ox yoke 235
Ornamental fabrics 390
Packing for boxes etc. 238, 126, 318
Paint from coal 246
Paper manuf. 318
Paper folder 94
Paper holder 411
Hay rakes 426, 411
Paring horsehoofs 134
Pentagraphs 389
Pendulum 70
Pessaries 79
Pen and pencil cases 134
Pianofortes 389, 162, 254, 326, 86
Pile sinker 166
Pill box machine 214
Pile for rugs 302
Planing machine 182, 230, 389, 294, 62, 411
Plow cleaner 278, 246
Plow shares 262
Plow for corn 208
Plow and clevis 238
Plow, seed planter 94
Pottery ware 94
Potash making 389
Propellers 389 two claims, 262, 294, 230, 286, 94
Printing presses 238, 389, 278, 310
Press, taking paper from 226
Pumps, 214, 110, 102, 230, 94
Punching 174
Quilting frames 302
Rattan dressing 79
Raking hay 246
Regulators 294, 70, 198, 270
Registers 389, 302
Respiring apparatus 342
Refrigerators 198
Rice huller 70
R. K. chair machine 270
Road repairer 334
Rotary cutters 238
Rolling mill 102
Rule, joint 182
Sash stoppers 234, 102, 254, 262, 342, 334, 214, 174, 246, two claims, 142
Saw mills 150, 86, 142, 238
Saws 406
Saw hanging 270
Saves, looking 190
Safe, fire 118
Sail making 62
Scrapers 326, 382, 206, 278, 102, 246
Scales 246, 86, 138
Screw machine 278
Screw cutting 246
Screw, wood 206
Scythe Snaths 86
Serving mallet 359
Seed planter 382, 199 two cl., 126, 238 70, 86, 158, 214, 246, 254 two claims, 230
Seed drills 234, 86
Seeding apparatus 158, 342
Separator 102
Sewing machines 254, 286, 411
Seraphines 190
Shingle machines 62, 142 2 cl.
Shank stopper 246
Sheet iron 310
Sheet metal cutter 389
Shutter fastener 342, 246
Signal lantern 118
Skins 286
Slat dresser 270
Smut machine 182, 302, 262, 370, 142
Soup bread 174
Speeder 374
Spinner 266, 411
Spindles and bobbins, 160, 166
Spiral knife grinder 294
Spooling machine 174
Spinning yarn 198, 134
Springs 62
Spark arrester 154
Splint machine 286
Splints for fractures 390, 411
Spike machine 326, 230, 389
Straw carriers 278
Stanchions 274
Straw cutters 334, 342 two cl., 406
Stirrups, safety 326
Steering apparatus 193, 230
Stand bases 254
Stearine 246
Street sprinler 246
Studs for shirts 406, 182
Stave dressing 411
Stave machines 174, 118, 110, 294
Stone dressing 374, 102, 326
Steam chest valve 278
Steam hammer 411
Stoves 406 four claims, 206, 214, 158, 254, 102 two cl., 230, 234, 318, 190, 198, 382, 334, 326 two cl., 262 two cl., 270, 110, 62 two cl., 286, 278 three cl., 230 two cl., 411
Stove pipe joints 294
Stove boiler 230
Stove polishing 278
Supporters 406, 204, 166, 230, 150, 389, 214
Sugar cane dryer 294
Sugar manuf. 94, 278, 411, 166 two claims
Tables, self-waiting 166
Tanning 230, 182
Tailors' measure 302, 70, 411
Teeth, artificial 102, 334
Telegraph 62, 302, 406, 182, 334
Telescopes, sub marine 234
Tennoning machine 382
Threshers 238, 318, 246, 286
Traps 318
Tobacco machine 238
Tobacco curing 142
Tools for hubs 230
Tongueing and grooving 150, 318
Trucks, R. R. 127, 182 two cl., 94
Trusses 406, 158
Trimming vessels 230
Tuyeres etc. 158, 294
Tubular rails 254
Turning machine 182
Turning lasts 79
Type for printers 389, 142
Valves puppet 166
Vaccine instrument 380
Vats and press boxes 270
Ventilator, ship 390
Vessels over shoals, carrying 389
Vessels, bows of 342
Vessels, marine 411
Vessel, model 334
Vices, parallel 246
Water closets 79
Water wheel reg. 79
Water wheels 334, 374
Water, raising 110 two claims
Washing machine 174
Washing dishes 286
Wagon top bows 390
Wash mixtures 166
Weighing frames 230
Weighing machine 380
Weather strips 62
Welt cutting 26
Whip polisher 294
Whip lashes 382, 174
Wheels for carriages 126, whiffletrees 318
Window blind borer 126
Window shutter 158
Window shutter fastener 182
Window curtains 190
Windowing machine 70, 160
Windlass 374, 79
Wire fence 62
Wood sawing 294
Wood preserving 302
Wooden bowl machine 374

